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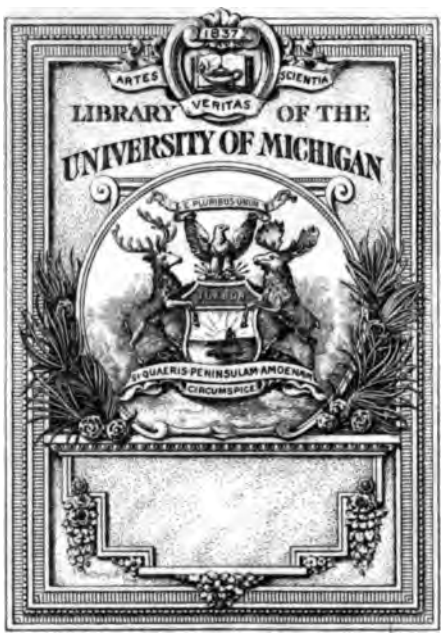

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VOL. XII.

SMITHSONIAN

MISCELLANEOUS COLLECTIONS.

VOL. XII.

"EVERY MAN IS A VALUABLE MEMBER OF SOCIETY WHO BY HIS OBSERVATIONS, RESEARCHES, AND EXPERIMENTS PROCURES KNOWLEDGE FOR MEN."—SMITHSON.

WASHINGTON:
PUBLISHED BY THE SMITHSONIAN INSTITUTION.
1874.

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ARTICLE III. (No. 263.) TELEGRAPHIC ANNOUNCEMENTS OF ASTRONOMICAL DISCOVERIES. By Prof. JOSEPH HENRY. April, 1873. Pp. 4.

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THE present series, entitled "Smithsonian Miscellaneous Collections," is intended to embrace all the publications issued directly by the Smithsonian Institution in octavo form; those in quarto constituting the "Smithsonian Contributions to Knowledge." The quarto series includes memoirs embracing the records of extended original investigations and researches resulting in what are believed to be new truths, and constituting positive additions to the sum of human knowledge. The octavo series is designed to contain reports on the present state of our knowledge of particular branches of science: instructions for collecting and digesting facts and materials for research: lists and synopses of species of the organic and inorganic world: museum catalogues: reports of explorations: aids to bibliographical investigations, etc., generally prepared at the express request of the Institution, and at its expense.

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JOSEPH HENRY,
Secretary S. I.

SMITHSONIAN MISCELLANEOUS COLLECTIONS.

181

REVIEW

OF

AMERICAN BIRDS,

IN THE MUSEUM OF THE

SMITHSONIAN INSTITUTION.

PART I.

BY

S. F. BAIRD.

WASHINGTON:
SMITHSONIAN INSTITUTION.
1864—1872.

ADVERTISEMENT.

THE Review of American Birds, of which the present work, by Prof. Baird, constitutes the first part, is intended to serve as a descriptive catalogue, with critical commentaries, of the species of American Birds in the Museum of the Smithsonian Institution; giving, at the same time, a list of the specimens, their localities, and donors. As indicated by the date at the beginning of each signature, it was published, sheet by sheet, between June, 1864, and June, 1866, and has been extensively in use by ornithologists, although not regularly distributed to Libraries and Societies. It is now reissued for that purpose, and, for the first time, with the list of species described, and with an alphabetical index.

JOSEPH HENRY,
Secretary S. I.

WASHINGTON, D. C.,
NOVEMBER 21, 1872.

PHILADELPHIA:
COLLINS, PRINTER.

INTRODUCTION.

THE primary object in undertaking the present work was to furnish a list of American Birds in the Museum of the Smithsonian Institution, with their localities and donors; and, as many of them are of considerable rarity, and others new to science, the opportunity has been embraced to give synoptical tables and descriptions of some of the genera and species. The signatures were distributed, as printed, to the leading ornithologists of the day, beginning June, 1864, and ending June, 1866; and the "Review" has been extensively quoted by writers.

It was at first proposed to confine the "Review" to North[1] and Middle America, but gradually the plan was extended until, in the later monographs, all procurable American species were included.

The present part of the "Review" includes all the slender-billed Oscines, with the exception of the *Cærebidæ*, which would have been added but for the difficulty of presenting a satisfactory definition of the genera, as compared with the allied forms.

A second part of the "Review" will be published as soon as it can be prepared.

SPENCER F. BAIRD,
Assistant Secretary S. I.

SMITHSONIAN INSTITUTION,
NOVEMBER 20, 1872.

[1] The southern boundary of the United States, but also including the whole Peninsula of Lower California, is here taken as that of *North* America; while by *Middle* America is to be understood the region intervening between the United States and the southern end of the Isthmus of Darien, and embracing the whole West Indies, excepting Tobago and Trinidad.

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REVIEW OF AMERICAN BIRDS

IN THE MUSEUM OF THE SMITHSONIAN INSTITUTION.[1]

BY
S. F. BAIRD.

PART I.

NORTH AND MIDDLE AMERICA.

OSCINES.

FAMILY TURDIDÆ.[2]

THE American *Turdidæ*, *Saxicolidæ*, and *Cinclidæ* are all closely related to each other by the presence of common characters, which distinguish them from the other allied American families of *Oscines*

[1] The present work is intended as a catalogue of the birds of Northern and Middle America in the Museum of the Smithsonian Institution, with such critical notices of the same as appear to be called for, and a list of the specimens, or of such of them as best show the geographical distribution of the species. Species not in the Smithsonian collection, but which I have had the opportunity of personally examining and comparing, are also included. Species mentioned by authors, but which I have not seen, will be mentioned at the end of the genera or families to which they are supposed to belong.

As understood in the present work, the term "North America" is intended to cover the region in and north of the valleys of the Rio Grande and Gila, or north of a line drawn from the mouth of the Rio Grande on the Gulf of Mexico, to that of the Yaqui, near Guaymas, on the east side of the Gulf of California, and embraces the peninsulas of Florida and of Lower California and Greenland. Middle America extends from the same line southward to the continental part of South America, including Mexico, Guatemala, San Salvador, Nicaragua, Honduras, Costa Rica, the Isthmus of Panama and of Darien, and the whole of the West Indies, excepting Trinidad and perhaps Tobago.

Any specimens which may serve to extend the list of the species enumerated as belonging to the Institution, or furnish additional material for investigation, will be thankfully received.

[2] For a synopsis of the American *Turdidæ*, See Sclater, Pr. Zool. Soc. 1859.

having uncovered nostrils and with ten primaries, the first of which is either spurious or much shorter than the second, agreeing in this respect with the *Sylvicolidæ* having nine primaries only. The most striking of these common characters is seen in the deeply cleft toes, of which the outer is united by the basal joint alone to the middle toe, while the inner is separated almost to the very base of its first joint.[1] The frontal feathers extend, with rare exceptions, to the very nostrils. The bill is elongated and subulate, moderately slender, and usually notched at tip; the culmen moderately curved from the base, and the mouth well provided with bristles, except in a few cases. Usually the scutellæ covering the front and sides of the tarsus are fused into one continuous plate, or else scarcely appreciable, except on the inner edge only; in the Mocking Thrushes they are, however, distinctly marked. The lateral toes are nearly equal, the outer rather the longer. With these as some of the principal characteristics, they may be distinguished from each other as follows:—

A. Nostrils oval. Loral and frontal feathers with bristly points, or interspersed with bristles; rictus with longer or shorter bristles.

Saxicolidæ. Wings very long and much pointed, reaching beyond the middle of the short square or emarginated tail, and one and a half times or more the length of the latter. The spurious primary very short, the second quill longer than the fourth. In the closed wing the outer secondary reaches only about two-thirds the length of longest primary.

Turdidæ. Wings moderate, more rounded, not reaching beyond middle of the often rounded tail, and not more than one and a third the latter, usually more nearly equal. Spurious primary sometimes half the length of second quill; the second quill shorter than the fourth. In the closed wing the outer secondary reaches three-fourths or more the length of longest primary.

---

[1] In a perfectly fresh specimen of *Turdus mustelinus*, the basal half of the first phalanx of the inner toe is connected with the 1st joint of the middle toe by a membrane which stretches across to within two-fifths of the end of the latter; there appears however to be no ligamentous adhesion. The basal joint of the outer toe is entirely adherent, and a membrane extends from nearly the basal half of the second joint to the distal end of the first joint of the middle toe. When this connecting membrane becomes dried the division of the toes appears considerably greater.

When the toes are all extended in line with the tarsus, the hind claw stretches a little beyond the lateral and scarcely reaches the base of the middle claw.

The plates at the upper surface of the basal joints of the toes are quadrangular and opposite each other.

B. Nostrils linear, in lower edge of nasal membrane. Loral and frontal feathers soft and downy, and no bristles or bristly points whatever about the mouth.

Cinclidæ. Body very short and broad. Wings short, rounded, and concave.

The American *Sylviadæ* are in some respects very closely related to the *Saxicolidæ*, but may be distinguished by their much smaller size, more slender and depressed bill, more strongly bristled rictus, etc.; on which account they are more strictly "fly-catchers," taking their prey in great part on the wing.

Of the three families, the *Turdidæ* contain a great variety of forms, and exhibit widely different characters, rendering it exceedingly difficult to arrange them in any systematic or regular sequence, or to accurately define their boundaries. In my work on the Birds of North America, I placed the Mocking Thrushes among the Wrens, on account of the distinct tarsal scutellæ, and other characters. I am now, however, inclined to believe, with Dr. Sclater, that their place is with the recognized *Turdidæ;* and among other reasons, on the ground of their more deeply cleft toes, and greater extension forward of frontal feathers. On the other hand, I have included *Donacobius* among the Thrushes, on account of the deeply cleft toes; although, as in the Wrens, the open nostrils are considerably in advance of the frontal feathers.

The following synopsis of such American forms of *Turdidæ* as I have had the opportunity of examining, may serve to determine the genera artificially, even though their natural affinities be somewhat violated. Nowhere is it more difficult than here to furnish in linear series, trenchant and positive characters which shall at the same time express and illustrate their true relationships. *Cichlerminia* and *Cinclocerthia*, which I have not seen, are placed by Dr. Sclater the one between *Turdus* and *Margarops*, the other between *Rhamphocinclus* and *Harporhynchus*. The primary division is into *Turdinæ*, or species with the tarsi "booted," that is, having all the scutellæ fused into a continuous plate covering the front of the tarsus and extending half way round on the two sides; and *Mimina*, or those with this same anterior half of the tarsus covered by a succession of imbricated overlapping scales, usually seven in number. In one species of *Mimocichla*, placed in the first section, the diyision of the scutellæ are appreciable, although they are all fused into one plate; while in the Cat-bird the scutellæ, in some specimens (as No. 20,396), are quite indistinguishable—the leg here being as much "booted" as in the true Thrushes; in others, however, they are per-

fectly distinct. Even in the first section individuals, in nearly all the species, may be noted with indications of separate scutellæ.

The *Turdus gigas* of Fraser has been placed among the typical Thrushes, but really differs in many important points, as does still more the *T. aurantius* of Jamaica, in shorter wings, much longer 1st primary, very long tarsi, and other characters of *Mimocichla*. I have accordingly been obliged to consider as a good genus the section *Semimerula* of Sclater, although I would prefer to consider *aurantius* as the type rather than *gigas* and its allies :—

A. **Turdinæ**.—Tarsus covered anteriorly with a continuous plate.

1. Wings decidedly longer than the tail,[1] which is nearly even. Bill considerably shorter than the head.
   - First quill one-half to one-third the second. Wings rounded. Tarsus longer than the head; outstretched toes reaching beyond the tail . . *Catharus.*
   - First quill usually not one-fourth the second. Wings pointed. Tarsus hardly the length of head, but yet longer than middle toe; outstretched toes falling short of tip of tail . . . . *Turdus.*
   - Wings as in *Turdus*. Tarsus shorter than middle toe. Bill short and very broad; width greater than distance from nostril to tip . . . *Platycichla.*[2]
   - First quill more than one-third the second. Wings rounded. Tarsus considerably longer than head; outstretched toes falling short of tip of tail. Bill lengthened . . . . . *Semimerula.*
2. Wings about equal to the tail, which is somewhat graduated. Bill stout, nearly as long as the head. Tarsus lengthened, considerably longer than middle toe and claw.
   - First quill more than one-third the second. Rictal bristles very short . . . . . *Mimocichla.*
3. Wings longer than the tail, which is considerably rounded. Bill longer than the head, and slightly decurved.
   - First quill more than half the longest . . . *Rhamphocinclus.*

B. **Mimineæ**.—Tarsi scutellate anteriorly; scutellæ seven.

4. Wings decidedly longer than the tail, which is nearly even. Tarsus as long as the head.
   - Tarsus hardly longer than middle toe and claw. Bill about equal to the head, decidedly notched;

[1] In the present work the length of the tail is measured from the coccyx, inside of the skin, and not, as usually the case, from the base of the quills at their insertion. The wings are measured from the carpal joint, with dividers.

[2] Possibly *Cichlopsis*, Cab., but differing much from his description.

wings rounded; 1st quill more than half the second; 5th longest. Claws very strong and much curved. Rictal bristles very short . . *Margarops.*

Bill decidedly shorter than the head, scarcely notched; wings pointed; 1st quill less than half the second; 3d and 4th longest. Claws not peculiar. Bristles prominent. Tarsus considerably longer than middle toe and claw . *Oreoscoptes.*

5. Wings decidedly shorter than the tail, which is considerably graduated; 1st quill half or more than half the second.

Tail firm, the feathers moderately broad: the exterior with outer web near the end, less than one-third the inner.

Bill lengthened; sometimes much decurved; no notch at tip . . . . . *Harporhynchus.*

Bill notched, shorter than head; straight.

Scutellæ very distinct . . . . . *Mimus.*

Scutellæ more or less obsolete . . . *Galeoscoptes.*

Tail rather soft: the feathers broad; the exterior with outer web near the tip rather more than one-third the inner (except in *Donacobius*).

Rictus without any bristles whatever . . . *Melanoptila.*

Rictus with well developed bristles . . . *Melanotis.*

Divisions of tarsus mostly obsolete. Rictus well bristled. Lateral tail feathers scarcely more than half the central; width of its outer web half the inner . . . . . *Donacobius.*

Of the family *Turdidæ*, as here given, the genera are all peculiar to America, with the exception of *Turdus;* and even here our species belong to sections scarcely if at all represented in the Old World, except by stragglers from the American Continent.

The sexes are all similar in the American species, except in some divisions of *Turdus*, in its most general sense.

A very remarkable peculiarity of form is observable in some of the species of *Oreocincla*, an Old World genus of *Turdidæ*, consisting in the possession of more than twelve tail feathers, a character quite unique, I believe, among the land birds.[1] Sundevall, in a communication on the subject to Cabanis' Journal für Ornithologie (1858, 159), gives *O. varia* and *malayana* as having fourteen tail feathers: the other species twelve. A specimen of *O. varia*, however, in the Smithsonian collection, received from the Philadelphia Academy, and of uncertain locality, has fifteen tail feathers, and has probably lost a sixteenth.

[1] See also Cabanis' Museum Heineanum, I, 1850, 6.

CATHARUS. Bonap.

Catharus, Bonap. Consp. I. 1850, 274. (Type *Catharus immaculatus*, Bonap.)
Malacocichla, Gould, Pr. Zool. Soc. 1854, 235. (Type *M. lepida*, Gould.)

The genus *Catharus* has been made by Dr. Sclater to include two groups: *Catharus* proper, in which the species have a close resemblance in coloration to the small American Thrushes as *T. fuscescens*, etc., but without any spotting on the breast, and without crest; and *Malacocichla* of Gould, in which the upper parts, or at least the head, are black, and with the feathers of the head above and nape moderately elongated, so as to form a bushy, rounded crest.

The species of *Catharus* proper, as just stated, closely resemble such small Thrushes as *Turdus fuscescens*, *minor*, etc. in coloration and external appearance. The bill is very similar, both in shape and character of bristles, which are perhaps not quite so long in some, longer in others. The plumage is, however, softer and fuller; the tarsi appreciably longer, the tail shorter, the feathers narrower. The principal difference is in the wings, which are short, rounded, and concave. The 1st quill in *C. melpomene* is nearly or quite half the 2d, which about equals the 8th quill. In *C. occidentalis* the wings are more pointed, the 1st quill about one-third the 2d, which is between the 7th and 8th in size. Here the bristles are shorter; while in *C. frantzii* they are unusually long. *C. occidentalis* forms the transition to the smaller spotted *Turdi*. In *C. (Malacocichla) maculatus* the 1st primary is shorter.

In all the skins I have seen the outstretched legs reach either very nearly to the tip of the tail or beyond it.

In one specimen of *C. melpomene*, from Mr. Lawrence's collection, the divisions of the tarsal scutellæ are distinctly definable on the anterior face, while they are confluent on the sides. It is possible that at one stage of development the tarsi, which are covered with a "boot," or a continuous plate, are distinctly scutellate—the scutellæ melting subsequently into a single plate. The occasional persistence of this immature feature in an adult bird may thus be explained without invalidating the importance of the character as Kaup has endeavored to do in the case of *Turdus migratorius*.

As Dr. Sclater has furnished an excellent synopsis of the species of American *Turdidæ* (Pr. Zool. Soc. 1859), it will not be necessary here to do the same.

Catharus.

Catharus melpomene.

Turdus melpomene, CAB. Mus. Hein. I, 1850, 5 (Xalapa).—*Catharus melpomene*, SCL. P. Z. S. 1859, 323.—IB. Cat. Am. Birds, 1861, 1, No. 1.—CABANIS, Jour. 1860, 322.—SALVIN, Ibis, 1860, 29.
Catharus aurantiirostris, SCLATER, P. Z. S. 1856, 294 (not of HARTLAUB).

Hab. Mexico (Cordova, Orizaba, Oaxaca); Guatemala; Costa Rica.

Specimens vary somewhat in the shade of coloration and the intensity of the rufescence of tail and wings. The bill is generally (in the dried skin) bright yellow, sometimes orange, a little dusky towards the tip above; sometimes this latter shade encroaches on the culmen; in one specimen (No. 22,362) the whole upper mandible is light brownish, and in No. 2 of Mr. Lawrence's Collection it is nearly as black as in *C. occidentalis*. Some specimens have a shade of grayish in the feathers of the chin; but in none is there any indication of the yellowish-brown of the jugulum of *occidentalis*. The legs are always yellowish, though varying in the shade of this color. The rump and tail are always more rufous than the back, as in *Turdus pallasii* and its allies, though the contrast is not so striking.

A specimen (30,484) from Costa Rica, in imperfect plumage, differs in the prevalence of a grayish olive shade in the back, and a less intense shade of rufous on the rump and tail.[1] It is not improbable that this may be the true *C. aurantiirostris* of Hartlaub, which is said to differ in the more olive back. Although Hartlaub describes the whole upper parts as uniformly olivaceous, including the wings and tail, his figure represents the latter as being more rufous.

If the species of Hartlaub and Cabanis should hereafter prove to be the same, it is somewhat of a question to which of their names the priority should be assigned. The date of the *aurantiirostris* is March, 1850, exactly coeval with Bonaparte's "*immaculatus*." The name "*melpomene*" appears on page 5, of sig. 1, of Museum Heineanum, but without any signature date affixed—this practice not having been introduced until the appearance of the fourteenth signature, where the date of Jan. 1851 is printed at the bottom of page 107. There is nothing whatever to show that even if the first signature was published in 1850, it appeared as early as March.

[1] *Turdus aurantiirostris*, HARTLAUB, Rev. Zool. March, 1850, 158 (Venezuela); IB. Jard. Cont. Orn. 1851, 80, pl. lxxii. *Catharus aurantiirostris*, SCLATER, P. Z. S. 1859, 323. *Catharus immaculatus*, BON. Consp. March, 1850, 278 (Caracas).

NOTE.—Additional specimens received from Costa Rica—none in very perfect plumage—agree in being all rather grayer, with less contrast of back and tail coverts than Mexican and Guatemalan. They, however, vary considerably among themselves—some being quite decidedly olivaceous on the back. The most olivaceous specimens have the most brightly orange-colored bills. In some of the others the bill above is light horn color. No. 33,259 has an unusually large first primary—more than half the longest.

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,392	33,122	..	Cordova, Mex.	...	Verreaux.	.....
16,641	..	..	Mexico.	...	J. Gould.	.....
29,201	68	..	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.
32,451	322	..	"	...	"	"
32,453	65	..	"	...	"	"
7,951	..	Juv.	Guatemala.	...	J. Gould.	.....
13,661	..	..	"	...	Dr. Sclater.	.....
30,650	30	..	Dueñas, Guat.	Sept. 1862.	O. Salvin.	Salvin & Godman.
30,462	11	..	San Jose, Costa	...	Dr. Frantzius.	J. Carmiol.
..	1	..	Mexico. [Rica.	...	Cab. of G. N. Law-	D'Oca.
..	2	..	Guatemala.	...	" [rence.	.....
33,256	109	..	"	...	Dr. Frantzius.	.....
33,256	110	..	"	...	"	.....
33,259	..	..	"	...	J. Carmiol.	.....
33,255	..	..	"	...	"	.....
33,257	..	..	"	...	"	.....

16,641. Upper mand. black; rufous of wings very intense.—29,201. Bill orange red, in skin yellowish.—33,259. 1st primary very large.

Catharus occidentalis.

Catharus occidentalis, SCLATER, P. Z. S. 1859, 323, 370.—IB. Cat. Am. Birds, 1861, 1 (No. 2).

Hab. Mexico (Oaxaca and Totontepec (*Sclater*); Orizaba).

This species may readily be distinguished from *C. melpomene* by several characters. The general color above is much the same; but while the rump, tail and wings are little, if at all more rufous than the back, the head above and nape are decidedly so. There is an indication of streaks on the jugulum and throat, the feathers being pale buff at base, broadly streaked centrally, and tipped with plumbeous; while in *melpomene* there is no indication of the buff, nor of streaks, the feathers being pure plumbeous, except where the whitish basal portion shows on the chin and throat. The legs are darker and more olivaceous. The bill is dark brown, almost black, except the yellowish basal portion of lower jaw. The wings are longer and more pointed, the longest primary exceeding the 10th by .65 of an inch, instead of .35 to .40. The spurious primary is smaller and narrower, its exposed portion reaching over scarcely more than one-

third of that of the 2d quill, instead of nearly or quite one-half. The bill is shorter and more slender (.36 or less from tip to nostril, instead of .42). The tarsi and toes are absolutely and relatively about the same length as in *melpomene* (tarsus 1.25, middle toe and claw .85 in No. 22,361; a little less in 29,202).

It will be seen from the specimens indicated as from Orizaba, that this species is not confined to the west coast, as supposed.

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,361	40,760	..	Mexico.	...	Verreaux.	
29,202	202	..	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.
32,454	202	..	"	...	"	"
32,455	202	..	"	...	"	"
32,456	202	..	"	...	"	"
32,457	202	..	"	...	"	"
32,458	399	..	"	...	"	"

22,361. Not exactly like type.

Catharus frantzii.

Catharus frantzii, CAB. Jour. Orn. for Sept. 1860 (pub. Jan. 1861), 323 (Costa Rica).

Hab. Costa Rica.

No. 30,482. First primary about half the 2d. Above rufescent olive, a little more rufous on the rump and tail, still more so on the head above and nape; the outer edge of primaries a little grayer than the back. Beneath plumbeous gray, darkest on the front and sides of the breast, under wing covers, and thighs. Edges of throat feathers perhaps a little lighter. Sides of head grayish. Flanks, middle of belly and anal regions white; under tail coverts pale rusty, some of the feathers faintly edged with plumbeous. Upper mandible black; lower yellow, but rather brownish at tip; legs pale brown. Length, 7.60; wing, 3.30; tail, 3.20; bill, from nostril to tip, .41; tarsus, 1.36; middle toe and claw, 1.00; 5th or longest primary, .47, longer than the tenth.

Another specimen (No. 30,483), although quite different, appears to be a more immature stage of the same species. The upper parts are darker and tinged with a more brownish rufous; the breast and sides are also strongly marked with the same.

The *Catharus frantzii* is intermediate between *C. melpomene* and *occidentalis*. The back is more olivaceous and darker than in the latter, the head of much the same color. Different from either, the outer webs of the primaries are grayer than the back, instead of

more rufous. There are no streaks on the throat as in *occidentalis*, or else they are very faintly indicated; and the plumbeous of the under parts is much darker than in *melpomene*. The bill and feet are colored as in *occidentalis*, the feet still darker than in the latter species. The bill is proportionally as large as in *melpomene*; the bristles apparently very long.

List of Specimens.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,482	89	Ad.	Costa Rica.	...	Dr. Frantzius.	Dr. Frantzius.
33,254	90	"	"	...	"	"
30,483	148	Juv.	"	...	"	"

Malacocichla.

Catharus dryas.

Malacocichla dryas, Gould, P. Z. S. 1854, 285, pl. 79 (Guatemala).—Sclater & Salvin, Ibis, 1859, 7.—Sclater, P. Z. S. 1859, 334.

Hab. Guatemala.

Above slaty olive-green; the top and sides of the head, including lower jaw, continuous and deep black; beneath light ochry yellow, becoming yellowish-white on the belly and anal region; crissum tinged with brown; sides of body and inside of wings somewhat like the back; small indistinct spots of olivaceous on the chin and throat, which become larger and more rounded on jugulum and breast. Bill and legs yellow.

Length, 6.00; wing, 3.60; 1st primary, .96; tail, 2.75; bill from nostril, .40, from gape, .92; tarsus, 1.40; middle toe and claw, .96.

This species is easily distinguished from *C. maculatus*[1] of Ecuador, by the much more olive back (not dark ash) and ochry yellow breast. The wings are longer and the tail shorter in proportion (in *maculatus* measuring respectively 3.50 and 3.00).

I am indebted to Mr. Salvin for the opportunity of examining his cabinet specimen of this species, lent me for the purpose. (No. 31, Salvin coll. Tileman, Rio Potochic, Guatemala, Jan. 1861.) It does

[1] A specimen of *Malacocichla*, in Mr. Lawrence's collection, from the Napo, with a general resemblance to a type Napo skin of *M. maculatus* received from Mr. Verreaux, is in some respects more like *M. dryas*. Thus the upper parts, instead of being grayish sooty, are more olive, the under parts more ochraceous yellow. The crissum, however, instead of being yellowish-white, like the anal region, is of a snuffy brown. The tail is much longer (3.30).

not agree exactly with Mr. Gould's description, but is probably the same species.

Catharus mexicanus.

Malacocichla mexicana, Bon. Comptes Rendus, XLIII, Nov. 1856, 998 (Xalapa).—*Catharus mexicanus*, Sclater, P. Z. S. 1859, 324.—Ib. Catal. 1861, 1, no. 4.

Hab. S. Mexico; Guatemala.

Above yellowish olive, with a tinge of rufous in the rump and base of tail. Top and sides of head black, this color not extending to sides of lower jaw, which are dark ash. Beneath ashy; the chin and throat whitish; middle of belly and crissum white; breast and sides tinged with olive. Bill yellow; dusky along culmen; tip brownish yellow or very pale corneous.

Length, 6.00; wing, 3.55; 1st primary, .90; tail, 2.80; bill, from nostril, .40, from gape, .90; tarsus, 1.30; middle toe and claw, .88.

Specimen examined, No. 32 of Mr. Salvin's collection, Rio Potochic, Tileman, Guatemala, Jan. 1861 (lent by Mr. Salvin).

This species is easily distinguished by the combination of the yellowish olive back, black head, and absence of spots beneath. The olive has a more gamboge tinge than in *dryas*, and the black of the head does not extend over the lower jaw. There is nothing of the ochry yellow of the under parts, nor the spots of *dryas*.

TURDUS, Linn.

Turdus, Linn. Syst. Nat. ed. 10th, 1758, 168. (Type *T. viscivorus* of Europe.)

The genus *Turdus* is an exceedingly cosmopolitan one, embracing species from nearly all parts of the world excepting Australia. There are many minor variations in external anatomy and style of coloration; but the transition is so gradual from one form to another as to render it exceedingly difficult to separate them generically to any considerable extent. They agree in the conical subulate bill, shorter than the head; the tip gently decurved and notched (except in *Hesperocichla*); the rictus with moderate bristles; the wings rather long and pointed, with small 1st primary (less than one-fourth the second); considerably longer than the tail, which is firm, nearly even, with broad feathers. Tarsi variable, seldom as long as the skull, the scutellæ fused into a continuous plate; only in rare individual instances showing indications of the lines of separation.

The following arrangement of the genus is proposed as expressing, with some accuracy, the characters of the American species:—

Sexes similar.

Hylocichla. Smallest species. Bill short, broad at base; much depressed. Tarsi long and slender, longer than middle toe and claw by the additional length of the claw; outstretched legs reaching nearly to tip of tail. Body slender. Color: above olivaceous or reddish, beneath whitish; breast spotted; throat without spots.

Turdus. Bill stouter and higher. Tarsi short, scarcely longer than middle toe and claw. Body stout, generally whitish beneath and spotted. (2d quill longer than 5th?).

Planesticus. Similar to preceding. (2d quill shorter than 5th?). Beneath mostly unicolored; unstreaked except the throat, which is whitish with dark streaks.

Sexes dissimilar.

Merula. Similar to *Turdus*. Male usually more or less black, especially on the head; females brownish, often with streaked throats. Bill distinctly notched.

Hesperocichla. Similar to *Turdus*. Male reddish beneath, with a black collar. Bill without notch.

Of the preceding sections into which I have divided *Turdus*, the first one is possibly entitled to full generic rank. It is intended to include the small North American species, with *Turdus mustelinus*, Gm., at the head as type, which are closely connected on the one side with *Catharus*, by their lengthened tarsi, and with *Turdus* by the shape of the wing. The bills are shorter, more depressed, and broader at base than in typical *Turdus*, so much so that the species have frequently been described under *Muscicapa*.

The section *Turdus*, as well as the entire genus itself, has as its type *Turdus viscivorus* of Europe. We have no native representative of this group—one species only, *Turdus iliacus*, coming into the American fauna from its occurring in Greenland.

Planesticus, first announced, as far as I can ascertain, by Bonaparte in his Notes on Delattre's Collection, 1854, 27, appears to have as its type *T. jamacensis* (*T. lereboullleti* of Bonaparte, erroneously credited to Colombia instead of Jamaica). It is among these species that we find the closest relationships to the large European Thrushes, as *viscivorus*, etc. The legs are short and stout. In the best known species—*T. migratorius*—there is an occasional indication of separate scutellæ on the lower part of the tarsi, to which Kaup has called attention in the Archiv für Naturgeschichte. I find the same feature in a specimen of *T. viscivorus*, No. 18,716, in *T. torquatus*, 18,944, and many other species, and consider it merely a condition of immaturity of development.

The type of *Merula* (Leach, 1816) is *Turdus merula* of Europe. It differs from the American species I have seen in having the claws much longer and less curved.

Turdus nævius should be removed from its position among the *Planestici* and placed either among *Merula*, or even assigned to a separate division. It agrees with *Merula* in the dissimilarity of color in the sexes; but differs from all the American true Thrushes in a much more subulate and slenderly conical bill, without any notch at the tip. The claws are longer and straighter than in *T. migratorius*, more like typical *T. merula*. In form it is perhaps nearer *T. torquatus* than other species of *Merula*.

It is somewhat of a question as to what name should be given to the section of *Turdus*, of which *nævius* is the type. Bonaparte, in his Notes on Delattre, states that *Turdus nævius*, Gm., is the type of his new genus *Ixoreus*, and that it is not a Thrush at all, but a true *Tæniopterien*. Dr. Sclater, to whom Bonaparte exhibited his supposed species, *T. nævius*, states (Pr Zool. Soc. 1859, 331) that it proved to be the *Tænioptera rufiventris*, of South America, a bird of an entirely different order. Now, on the one hand, *Turdus nævius*, Gm., is positively stated by Bonaparte to be the type of his genus *Ixoreus*. Dr. Sclater, however, explains Bonaparte's erroneous ideas of its affinities by showing that he had in view an entirely different species, a fact which only accidentally comes to light. Under these circumstances, if *Ixoreus* is not to be applied to *nævius*, must it not be assigned to *Tænioptera rufiventris*, in case that species should need a new generic appellation; or should it be dropped altogether? On the whole I am inclined to adopt the latter view, and accordingly propose the name *Hesperocichla*.

It will be understood, of course, that the preceding arrangement of *Turdus* is only provisional, and merely intended to hint at the affinities of the American species. Without a full series of the Old World Thrushes, I can only base my notices on the species I have before me.

Hylocichla.

Turdus mustelinus.

Turdus mustelinus, Gmelin, Syst. Nat. I, 1788, 817.—Audubon, Orn. Biog. I, 1832, 372, pl. 73.—Ib. Birds Am. III, 1841, 24, pl. 144.—D'Orb. La Sagra's Cuba Ois. 1840, 49.—Baird, Birds N. Am. 1858, 212.—Sclater, P. Z. S. 1856, 294, and 1859, 325.—Ib. Catal. 1861, 2, No. 6.

Turdus melodus, Wils. Am. Orn. I, 1808, 35, pl. ii.

Turdus densus, Bonap. Comptes Rendus, XXVIII, 1853, 2.—Ib. Notes Delattre, 1854, 26 (Tabasco).

Additional figures: VIEILLOT, Ois. Am. Sept. II, pl. lxii.—WILSON, Am. Orn. I, pl. ii.

Hab. U. S. east of Missouri plains, south to Guatemala. Cuba, LA SAGRA; Honduras, MOORE (Pr. Z. S. 1859, 55).

This species varies less in its markings and shade of color than perhaps any of our small spotted Thrushes. In some there is a faint tinge of pale buff on the under parts, which are nearly pure white in others, with the wash of buff restricted to the breast. Some specimens appear more spotted beneath than others, but this is the case with Northern skins (as 1569, from Carlisle) equally with more Southern; in fact specimens from Guatemala and Mexico exhibit precisely the same variations in this respect. I am, therefore, not disposed to consider *Turdus densus*, of Bonaparte, as a good species, unless possessing distinctive characters not mentioned by that author, and other than that of being more thickly spotted beneath, with the spots larger and the bird smaller.

The young *Turdus mustelinus* is like the adult, except in having rusty yellow triangular spots in the ends of the wing coverts.

Dr. Sclater gives Jamaica as one of the winter localities of this Thrush. Mr. March has never met with it, and is of the opinion that the bird referred to by Gosse is the *Mimus hillii*, at one time supposed by the Jamaican Ornithologists to be the *T. mustelinus*.

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,650	..	..	Fort Pierre, Neb.	May 3, 1855.	Col. Vaughan.	Dr. Hayden.
8,390	96	♀	Independence, Mo.	June 22, '57.	W. M. Magraw.	Dr. J. G. Cooper.
22,356	34,414	..	Mexico.	...	Verreaux.	.....
7,947	..	..	Guatemala.	...	J. Gould.	.....
..	3	..	"	...	Cab. Lawrence.	.....
20,392	377	..	Coban, Vera Paz.	...	O. Salvin.	Constancia.

8,390. Iris brown.

Turdus pallasii.

Turdus pallasii, CABANIS, Wiegmann's Archiv, 1847 (I), 205.—IB. Journal f. Orn. 1855, 470 (Cuba).—BAIRD, Birds N. Am. 1858, 212.—SCLATER, P. Z. S. 1859, 325.—IB. Catal. 1861, 2, No. 7.

Turdus solitarius, WILSON, Amer. Orn. V, 1812, 95 (not of LINNÆUS).—SCLATER, P. Z. S. 1857, 212.

Turdus minor, BON. Obs. Wilson, 1825, No. 72.

Turdus guttatus, CABANIS, Tschudi, Fauna Peruviana, 1844, 187 (not *Muscicapa guttata* of PALLAS).

Additional figures: AUD. Birds Am. III, pl. cxlvi.—IB. Orn. Biog. I, pl. lviii.

Hab. Eastern North America. Cuba, CAB. Mexico?

A large series of specimens from the northern parts of the United States shows considerable variations in color, etc. In all, of course, the rump and tail are rufous, in decided contrast with the rest of the upper parts. The shade of color here varies considerably, however: generally it is of reddish olive, sometimes as bright and of the same shade as in *T. fuscescens* (as in 7591, Washington), though generally a little less intense. In two specimens only does the back have the olive rather than reddish shade predominant (28,225, Washington; 29,649, Maine), as in *T. swainsonii* and *nanus*. These specimens are almost as small as *nanus*, but have the large bill and fulvous tinge of sides and crissum of *pallasii*. In many specimens there are vestiges of the lighter spots on the ends of the wing coverts.

The under parts do not vary much, although sometimes the tinge of pale buff across the breast is more decided; sometimes nearly wanting. The size is pretty constant; the wing rarely exceeds 3.75, in one case only (2,092, Carlisle) measuring 3.85; in half the specimens it is about .20 less. The bill, too, is pretty constantly .40 from tip to nostril. The tarsi measure about 1.15.

A young bird has all the feathers of the head, back, and wing coverts streaked centrally with drop-shaped spots of rusty yellowish.

I have seen no specimen of this bird from south of the limits of the United States. Mr. Sclater quotes one from Orizaba; but it may be the *auduboni*, as Prof. Sumichrast has sent a specimen referable rather to the latter variety.

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,610	505	..	Fort Simpson, B. A.	Sep. 6, 1860.	B. R. Ross.	.....
..	..	..	Fort, Peel's River.	...	C. P. Gaudet.	.....
..	..	..	Ft. Rae, Slave Lake.	...	L. Clark, Jr.	.....
31,413	..	..	Ft. Resolution, "	...	J. Lockhart.	.....

Turdus nanus.

Turdus nanus, AUD. Orn. Biog. V, 1839, 201, pl. cci.—BAIRD, Birds N. A. 1858, 213.—SCLATER, P. Z. S. 1859.—IB. Catal. 1861.

? *Turdus aonalaschka*, GMELIN, S. N. I, 1788, 808.

?? *Muscicapa guttata*, PALLAS, Zoog. Rosso-Asiat. II, 1811, 465.

Hab. Western North America (south of Columbia R.?) to Rocky Mountains, south to Cape St. Lucas.

I have little to add to the remarks on this species in the Birds of North America, except that the predominant shade in the back is the olive of *swainsonii* rather than the reddish of *fuscescens*, as in *T. pallasii*. I have, however, not mentioned the difference in the bill, which, besides being smaller, is much more depressed, as in *Anthus*. The height of the bill at the base just back of the nostrils in *pallasii* is from .17 to .19 of an inch, while in *nanus* it is only .15. The distance from tip of bill to nostril is .35 or .36; the length of tarsus, 1.07 to 1.10; the wing, 3.30 to 3.48. The clear plumbeous cast of the flanks and thighs, and the white crissum of *nanus*, contrast characteristically with the rufous tinge of the same parts in *pallasii*. The legs are rather darker and considerably more slender.

Pallas, in his Zoographia Rosso-Asiatica, I, 1831 (?), 465, describes a *Muscicapa guttata* from Kodiak, an island of the Russian American Archipelago, collected by Billings. This was, in all probability, a young Thrush in the immature spotted plumage, and if any described North American species, may, from its size and coloration, be referred to *Turdus nanus*, rather than to any other Thrush. Should this be substantiated, the name *guttatus* must take precedence; but as there is still some uncertainty on the subject, I prefer to make no change at present until young birds of the species can be procured. A young *T. pallasii* shows some rather marked differences from Pallas' description.

List of Specimens.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
8,168	..	..	Sacramento Valley.	...	Lt. Williamson.	Dr. Newberry.
16,143	353	♀	Fort Crook, Cal.	May 20, '59.	J. Feilner.	.....
10,885	..	♂	Fort Bridger.	April 29	C. Drexler.	.....
8,170	..	..	Frontera, Tex.	May 8.	Major Emory.	Chas. Wright.
32,165	10,781	♂	San Gertrude Mt., Cape St. Lucas.	Jan. 1861.	J. Xantus.	.....

Turdus auduboni.

Turdus auduboni, Baird.

Merula silens, Swainson, Philos. Mag. I, 1827, 369 (not *Turdus silens* of Vieillot, Encycl. Mèth. II, 1823, 647, based on *T. mustelinus*, Wils. = *T. fuscescens*).—Ib. Fauna Bor.-Amer. II, 1831, 186.—Baird, Birds N. Amer. 1858, 213, and 922.—Sclater, P. Z. S. 1858, 325 (La Parada), and 1859, 325 (Oaxaca).—Ib. Catal. Am. Birds, 1861, 2, no. 9.

Hab. Rocky Mountains, from Fort Bridger south into Mexico.

Since my article on the genus *Turdus* was published in the Birds

of North America, I have seen several other specimens of the large race of *Turdus pallasii*. The back is rather more olivaceous than in *pallasii*, the rump paler and less rufous, and the colors generally much as in *nanus*. In the largest specimen (10,886, from Fort Bridger) the wing is 4.18 inches; tail, 3.60; bill, from tip to nostril, .45; tarsus, 1.26. Other specimens from Mexico and Guatemala are a little smaller, but all exceed *pallasii* in size.

This species or race appears to belong to the high table lands of North America; the skin collected by Mr. Drexler, at Fort Bridger, and that from Cantonment Burgwyn (both localities in the Rocky Mountains), being however the only specimens recorded from the United States. On the other hand, it seems to be rather common in Mexico and Guatemala.

A specimen from Orizaba agrees with the others referred to in the grayer plumage above, although not larger than many of the true *pallasii*. It is probably the same variety that Dr. Sclater refers to as *T. pallasii* from Orizaba.

Whether the present bird be specifically distinct from *T. pallasii* or not, there is no doubt of its being a decidedly marked race, of larger size and grayer plumage above. While, as defined, the true *T. pallasii* is confined to eastern North America, possibly not migrating south of its limits, the *T. auduboni* belongs to the central North American plateau, ranging from Fort Bridger to Orizaba.

As the name of *T. silens* is pre-occupied in the genus by Vieillot, I have ventured to affix the name of *T. auduboni* to the present bird, basing the name upon the largest specimen from Fort Bridger (10,886).

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,886	483	♂	Fort Bridger?	May 28, '58.	C. Drexler.	.....
11,734	..	..	Cantonment Bur-	...	Dr. W. W. Ander-	.....
7,950	..	..	Mexico. [gwyn, N.M.	...	J. Gould. [son.	.....
13,579	..	..	"	...	"	.....
13,580	..	..	"	...	"	.....
32,459?	355	..	Orizaba.	...	Prof. Sumichrast.	.....

10,886. Type. No. 11,734. 8; 11.25; 3.75.

Turdus fuscescens.

Turdus mustelinus, WILSON, Am. Orn. V, 1812, 98, pl. 43 (not of GMELIN).
Turdus fuscescens, STEPHENS, Shaw's Gen. Zool. Birds, X, I, 1817, 182. CAB. Jour. 1855, 470 (Cuba).—BAIRD, Birds N. Am. 1858, 214.—SCLATER, P. Z. S. 1859, 326.—IB. Catal. Am. Birds, 1861, 2, no. 10.
Turdus silens, VIEILL. Encyclop. Méth. II, 1823, 647 (based on *T. mustelinus*, WILS.).

Turdus wilsonii, Bon. Obs. Wils. 1825, No. 73.
Turdus minor, D'Orb. La Sagra's Cuba Ois. 1840, 47, pl. v (Cuba).

Hab. Eastern North America; Cuba; Panama (winter).

There is not much variation in the color, and but little in the size of this species. The spots on the breast are sometimes more distinct than common, but less so than in *T. ustulatus*, and they never extend so far back.

It is a matter of some geographical interest that Mr. Drexler obtained the true *T. fuscescens* at Fort Bridger, in the Rocky Mountains, instead of *T. ustulatus*, its western representative.

The collections of the Smithsonian Institution do not contain specimens of this species from any point north of Fort Garry, nor south of the limits of the United States, although Mr. Lawrence has a skin from the Isthmus of Panama. I do not find it quoted as from beyond the United States by recent authors.

List of Specimens.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,299	..	..	Halifax, N. S.	...	W. G. Winton.	.....
18,083	16	..	Portsmouth, N. H.	...	E. Coues.	.....
14,132	..	..	Red River Settle-	...	C. S. Hubbard.	.....
18,522	23	..	"[ment, B. A.	...	D. Gunn.	.....
13,698	..	♂	Rainy Lake.	May 29.	R. Kennicott.	.....
4,713	..	..	Mo. of Vermillion.	...	Lt. Warren.	Dr. Hayden.
10,881	..	♀	Fort Bridger, Utah.	May 27, '58.	C. Drexler.	.....
..	b	♀	Panama.	...	Cab. Lawrence.	M'Lean. & Galb.

13,132. No. 2,256. Eggs. No. 8. Cabinet of G. N. Lawrence.

Turdus ustulatus.

Turdus ustulatus, Nuttall, Man. I, 1840, 400 (Columbia River).—Baird, Birds N. Am. 1858, 215, pl. lxxxi, fig. 1.—Cooper & Suckley, P. R. Rep. XII, II, 1860, 171.

Additional specimens of this bird, received since the publication of the "Birds of North America," have satisfied me of the validity of this species. Of the diagnostic characters there enumerated, I find that of the fulvous or yellowish brown of the axillars (and to some extent of the tibiæ), as compared with their purer ash in *fuscescens* to be a constant one. The spots on the breast are much better defined, darker, and extend farther back on the breast. The sides are more of a yellowish-brown. The bill is much darker, being dark brown except at the base of the lower mandible, which is yellowish, and in marked contrast to the remainder; while in *fusces-*

cens the lower mandible is yellowish, only tinged with brownish (sometimes scarcely appreciable) towards the end.

This species hitherto has not been noted as found outside of the limits of Washington Territory and Northern Oregon, nor as far east as the Rocky Mountains—the most eastern point being Chiloweyuck Depot, of the Northwestern Boundary Survey (as 15,931, July 3, 1859, Dr. Kennerly), where it was found breeding very abundantly. The eggs bear a close resemblance to those of *T. swainsoni*, being thickly spotted, instead of being plain blue, as in its nearest relative, *T. fuscescens*.

Turdus swainsonii.

Turdus swainsonii, CAB. Tschudi, Fauna Peruana, 1844–46, 188.—? SCLATER & SALVIN, Ibis, 1859, 6 (Guatemala).—SCLATER, P. Z. S. 1858, 451 (Ecuador); 1859, 326.—IB. Catal. 1861, 2, no. 11.—BAIRD, Birds N. Am. 1858, 216.—GUNDLACH, Cab. Jour. 1861, 324 (Cuba).

Turdus minor, GMELIN, Syst. Nat. I, 1788, 809 (in part).

Turdus olivaceus, GIRAUD, Birds L. Island, 1843–44, 92 (not of LINN.).

(?) *Turdus minimus*, LAFRESNAYE, Rev. Zool. 1848, 5.—SCLATER, P. Z. S. 1854, 111.—BRYANT, Pr. Bost. Soc. VII, 1860, 226 (Bogota).—LAWRENCE, Ann. N. Y. Lyc. 1863. (Birds Panama, IV, no. 384.)

Hab. Eastern North America; westward to Ft. Bridger and Upper Columbia, north to Arctic Ocean, south to Ecuador.

There is not much difference in the color and size of specimens of this species from different parts of the United States. There is a strong fulvous tinge on the throat, breast, and side of head and neck, a tawny yellowish ring round the eye, and a decided line of the same extending from the nostrils to the eye. The upper parts are of uniform olivaceous, and pretty constant in shade; sometimes a little grayer, sometimes with a faint tinge of rufous, though this is usually almost inappreciable.

Sometimes the fulvous tinge of the breast is so slight as to induce a resemblance to *T. aliciæ;* but here the persistence of the yellowish ring round the eye, and the line from eye to nostril, will generally determine the species. In a few instances the ring round the eye and loral line are very pale, but I have considered the distinct existence of the latter as inclining the decision in favor of *swainsonii*. It is quite possible that some of these doubtful specimens may be hybrids of the two species, as they invariably come from the regions where both breed abundantly.

The bill is generally rather small, on an average measuring .35 from front of bill to nostril; in one or two specimens in the series, as 22,250, from Washington, it measures .40, or nearly as much as

aliciæ. One specimen (5,657) from Kansas, has the bill only .30 from nostril to tip; the tarsi, .99; wing, 3.80; tail, 2.88. In an average specimen from Carlisle (2,639) the bill is .40; tarsus, 1.12; wing, 3.75; tail, 2.85.

A specimen from Panama, belonging to Mr. Lawrence's collection, and which he refers to the *Turdus minimus* of Lafresnaye, is smaller than the average of northern specimens, with shorter bill. It is a very little less than the Kansas specimen, with the bill a little longer; but several Carlisle and other northern specimens have the wings and tail still shorter. I am, therefore, disinclined to consider the specimen as anything more than *T. swainsonii*, perhaps a short billed variety to which the Kansas specimen may also belong.

If the *Turdus minimus* of Lafresnaye be properly described, it would appear to be different from any of the varieties of *T. swainsonii*.

This species has been found to occur farther to the west than was formerly supposed. Mr. Drexler obtained specimens at Fort Bridger, Dr. Cooper in the Bitterroot Mountains, and Dr. Kennerly, of the N. W. Boundary Survey, found it in Washington Territory. Northward it reaches almost to the Arctic Ocean, along the Mackenzie, and across from there to Fort Yukon; in fact it occurs throughout the whole northern heavily wooded region. I have seen no specimens from Labrador, where, however, *T. aliciæ* seems abundant.

Having had the opportunity of examining the specimen from Bogota, which Dr. Bryant referred to the species of Lafresnaye (no. 92 of Dr. Bryant's collection), I am able to corroborate the remarks of the former relative to its peculiarities. The spots are larger than common in the North American birds, and appear to extend farther back on the breast and sides, where, in fact, they are as dark as those on the jugulum, instead of being fainter and grayer of tint. The flanks are darker, and colored like the back, instead of being much lighter. The line from bill to eye, and probably the ring round the eye, are of a much more brownish-yellow.

I am, however, not ready to conclude that this specimen is specifically distinct from *Turdus swainsonii*, as North American skins vary a good deal in their characters, some of them approaching it in one direction and some in another. The size is nearly equal to the average of *swainsonii*, the skin being pressed up so as to seem shorter than it should be. It measures but 5.90, but should be at least 6.50; the wing is 3.80; the tail 2.95; bill to nostril, .36; tarsus, 1.04; all dimensions readily paralleled in the North American bird. The bill is fully as large.

The *Turdus minimus* of Mr. Lawrence, from Panama, is even more like typical North American birds.

It is quite possible that neither of these specimens belongs to the true *T. minimus* of Lafresnaye, as this author speaks of his bird being of a smoky brown tinge above, "just as in *Seiurus aquaticus (noveboracensis)*," a decidedly different color.

LIST OF SPECIMENS.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,622	..	..	Moose Factory, H.	...	J. Mackenzie.	.....
20,616	79	..	" [Bay.	July 3, '60.	C. Drexler.	C. Drexler.
20,614	485	..	Fort George.	July 11, '60.	"	.....
23,288	..	..	St. Stephens, N. B.	...	G. A. Boardman.	.....
2,206	..	♂	Carlisle, Pa.	May 3, 1845.	S. F. Baird.	.....
22,250	544	..	Washington.	...	D. W. Prentiss.	.....
27,189	86	♀	Fort Yukon.	June 20.	Jas. Lockhart.	.....
27,182	1,190	♂	"	"	R. Kennicott.	.....
23,221	..	..	Fort Good Hope.	...	R. W. M'Farlane.	.....
27,188	..	♀	Fort Simpson.	...	B. R. Ross.	.....
22,612	649	..	Big Island.	...	"	Jno. Reid.
19,479	..	..	Fort Resolution.	May 2.	R. Kennicott.	.....
17,960	62	..	Saskatchewan.	1859.	"	.....
11,585	..	..	Red River Sett.	...	D. Gunn.	.....
5,818	..	♂	Black Hills.	Sept. 18.	Lt. Warren.	Dr. Hayden.
8,302	15	..	Independence, Mo.	Mar. 27, '57.	W. M. Magraw.	Dr. J. G. Cooper.
6,993	..	♂	St. Louis, Mo.	May 15, '57.	Lt. Bryan.	W. S. Wood.
4,324	..	..	Calcasieu, La.	1854.	G. Wurdemann.	.....
12,199	..	..	Red Fork of Arkansas.	...	Dr. S. W. Woodhouse.	.....
8,215	147	..	Fort Laramie.	Sep. 10, '57.	Dr. J. G. Cooper.	.....
10,887	..	♂	Fort Bridger.	May 27, '58.	C. Drexler.	.....
22,037	93	..	Bitter Root Valley.	Sep. 3, '60.	Dr. J. G. Cooper.	.....
21,916	549	♂	Clark's Fork of Col.	...	A. Campbell.	Dr. Kennerly.
21,917	538	♀	" [River.	...	"	"
13,577	..	..	Mexico.	...	J. Gould.	.....
7,948	..	..	"	...	"	.....
13,578	..	..	Guatemala.	...	"	.....
20,393	..	..	Coban, Vera Paz.	...	O. Salvin.	.....
	5	..	Panama.	1862.	Cab. Lawrence.[1]	M'Leannan.

(2,206.) 7.40; 12.08; 4.08. (8,302.) Iris brown.

Turdus aliciæ.

Turdus aliciæ, BAIRD, Birds N. Am. 1858, 217, pl. 81, fig. 2.—COUES, Pr. Acad. Nat. Sci. Aug. 1861, 217 (Labrador)

The validity of this species, first established in 1858, in the "Birds of North America," has since been substantiated, and its geographical distribution ascertained by numerous specimens in the Museum of the Smithsonian Institution. Labrador and the Lower Mackenzie River, Ohio, Pennsylvania, and the District of Columbia, and to the south, Costa Rica, have all been added to the regions known to be inhabited by it. It is, in fact, a very remarkable circumstance, that for two or three years past it has been more abundant around Wash-

[1] Type of *minimus* of Lawrence.

ington than *swainsonii* itself. It certainly is much more common now than formerly, as none of the older collections embrace it among their species, while it is frequently met with at the present time.

As originally described, it differs from *swainsonii* in larger size, longer bill, feet, and wings especially, straighter and narrower bill. The back is of a greener olive. The breast and sides of the head are entirely destitute of the buff tinge, or at best this is very faintly indicated on the upper part of the breast. The most characteristic features are seen on the side of the head. Here there is no indication whatever of the light line from nostril to eye, and scarcely any of a light ring round the eye—the whole region being grayish-olive, relieved slightly by whitish shaft-streaks on the ear coverts. The sides of body, axillars, and tibiæ are olivaceous gray, without any of the fulvous tinge seen in *swainsonii*. The bill measures .40, from tip to nostril sometimes more; tarsi, 1.21; wing, 4.20; tail, 3.10—total, about 7.50. Some specimens slightly exceed these dimensions; few, if any, fall short of them.

At the time that this species was described, in 1858, the only known localities were Illinois and the line of the Missouri River along the mouths of the Vermilion and the James Rivers. Since that time its distribution has been found to be much more extensive. Although not yet found west of the Missouri, nor on it above Fort Union, it is abundant along the Lower Mackenzie, and especially about Fort Anderson, on Anderson River. It is rare on the Youkon, as well as on Slave Lake, except perhaps at the western extremity. Mr. Coues found it abundant in Labrador. It is now particularly common in the spring about Washington, and a few specimens have been obtained about Philadelphia.[1] South of this it has not been noticed with the single exception of the specimen recorded below. Dr. Bryant, however, thinks he has seen it in Dr. Gundlach's Cuban collection.

In a word, its distribution in North America, as at present known, is from the Missouri River and the Mackenzie on the west, to Wash-

[1] Mr. J. A. Allen, in a paper on the Birds of Springfield, Mass. (Pr. Essex Institute, IV, 1864, 56), speaks of *Turdus aliciæ* as abundant about Springfield, and as grading so insensibly into the *T. swainsonii*, as not to be entitled to consideration as even a strongly marked variety. I am inclined, however, to think, from the nature of his remarks and comparisons, that he has not seen what I call *T. aliciæ*.

During the many years I collected birds about Carlisle, and in the course of which I killed large numbers of *T. swainsonii*, I never saw an *aliciæ*, although I observed the same variations in shade and color of the former referred to by Mr. Allen.

ington and Philadelphia on the east, and northward to the shores of the Arctic Ocean, where, however, it is confined within narrow limits of longitude.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,328	194	♀	Fort Youkon.	June 30, '61.	J. Lockhart.	.....
27,203	1,420	..	La Pierre's House.	...	B. R. Ross.	J. Flett.
..	..	..	Fort Anderson.	...	R. MacFarlane.	.....
22,607	..	♀	Fort Simpson.	Sept. 10, '60.	B. R. Ross.	.....
18,072	100	♂	Grosvater Bay, Lab.	1860.	Elliot Coues.	.....
4,708	..	♂	Mo. of Vermilion.	May 8, '56.	Lt. Warren.	Dr. Hayden.
10,084	..	..	W. Northfield, Ill.	...	R. Kennicott.	Alice Kennicott.
22,288	..	..	Ohio.	...	J. M. Wheaton.	.....
22,246	..	..	Washington, D. C.	...	C. Drexler.	.....
30,485	91	..	San Jose, Costa Rica.	...	Dr. A. v. Frantzius.	.....

(27,323.) 7.20; 12.10; 4.10. (10,084.) Type.

Turdus iliacus.

Turdus iliacus, LINN. Syst. Nat. 10th ed. 1758, 168, and of European authors.—REINHARDT, Ibis, 1861, 6 (Greenland).

The occurrence of this well known European species in Greenland brings it within the limits of the American Fauna. Two Greenland specimens are recorded by Dr. Reinhardt: one of them shot at Fredericksshaab, Oct. 20, 1845.[1]

Planesticus.

Turdus jamaicensis.

Turdus jamaicensis, GMELIN, S. N. I, 1788, 809.—GOSSE, Birds Jam. 1847, 142.—BON. Consp. 1850, 271.—MARCH, Pr. A. N. S. 1863, 292.—SCLATER, P. Z. S. 1859, 327.—IB. Catal. 1861, 3, no. 13.

Turdus capucinus, HARTLAUB, Bp. Consp. 271.

Turdus lereboulleti, BP. Comptes Rendus, XXXVIII, Jan. 1854, 3.

Hab. Jamaica.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,144	..	..	Spanish town, Jam.	...	W. T. March.	.....

[1] This species is smaller than our Robin (*T. migratorius*), but of a similar grayish-olive above, including the head. The under parts are white; the feathers of the lower throat and breast streaked with brown. The sides, axillars, and inner wing covert are reddish cinnamon. A conspicuous white streak over the eye and extending as far back as the nape. Bill black, yellow at base of lower jaw. Legs pale-colored. Second quill longer than fifth. Length, about 8.25; wing, 4.64; tail, 3.45; bill, from gape, 1.07, from nostril, .44; tarsus, 1.16; middle toe and claw, 1.15. Specimen described: 18,718, ♂, received from the Royal Artillery Institution, Woolwich.

Turdus leucauchen.

Turdus leucauchen, SCLATER, P. Z. S. 1858, 447.—SCLATER, Ibis, 1859, 6.—IB. Catal. Am. Birds, 1861, 3, no. 16.

Hab. Guatemala. Mexico?

Description of No. 30,647. (Compared with type.) Above blackish ash, with tinge of olivaceous; wings and tail blackish brown, almost black. Beneath pale brownish ash; axillars and under wing coverts tinged with yellowish; flanks rather darker; middle of abdomen and crissum white. Inner edges of the quills towards base not lighter than elsewhere, but brown. Chin and upper throat white, the feathers streaked centrally with black; a conspicuous pure white patch at lower end of throat. Legs horn color; bill yellowish, tinged with brown along culmen towards the tip.

Length, 9.25 (skin); wings, 4.80; tail, 4.20; bill, from nostril, .50; tarsus, 1.16; middle toe and claw, 1.10; longest primary (4th and 5th), 1.10, longer than the shortest; 2d intermediate between 6th and 7th.

Specimens from Costa Rica, compared with 30,647, are smaller; the back more olivaceous; the median line of the belly whiter; the crissal feathers longer and more edged with plumbeous; the bill more tinged with brown. A triangular yellowish spot in the larger coverts apparently indicates a slight immaturity.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,360	43,465	..	"Mexico."	...	E. Verreaux.	.....
32,664	43,468	♀	"	...	"	.....
20,568	1,452	..	Choctun, Vera Paz,	Jan. 1860.	O. Salvin.	.....
30,647	3,011	..	" [Guat.	"	"	.....
..	7	..	Guatemala.	...	Cab. of G. N. Law-	.....
33,263	23	♂	Dota Mts., Costa	Jan. 27, '64.	J. Carniol. [rence.	.....
33,264	23	♂	" [Rica.	"	"	.....

30,647. "Compared with type." 33,263. Length, 9; extent, 13. Iris yellowish-brown. 33,264. Iris brown.

Turdus assimilis.

Turdus assimilis, CAB. Mus. Hein. 1850, 4.—SCLATER, P. Z. S. 1857, 202; 1859, 370 (eggs).—IB. Catal. Am. Birds, 1861, 3, no. 15.

Hab. Mexico (Vera Cruz, Orizaba, Oaxaca). Guatemala.

No. 22,351. Upper parts uniformly yellowish-olive, very much as in the brighter varieties of *Turdus swainsonii*. Wing and tail feathers (concealed portions) brown, of similar shade, without the

olive. Beneath pale grayish fulvous, rather darker on the flanks, where the color is much as on the back. Belly to crissum white. Chin white, the feathers streaked centrally with blackish brown; a whitish region posterior to the streaks.

Axillars yellowish fulvous, as also to a rather less degree, the inside of the wings, including the basal portion of inner webs of the quills. Bill and legs horn color, the under mandible paler.

Length, 8.75; wing, 5.20; tail, 4.30; bill to nostril, .57; tarsus, 1.20; middle toe and claw, 1.12; claw alone, .30; longest primary exceeds the shortest by 1.20; second quill intermediate between the 6th and 7th (.16 longer than the latter).

This specimen, in color of upper parts, wings and tail, is very similar to *Turdus grayi*, although readily distinguishable by the white abdomen, darker throat-streaks, etc.

Turdus leucauchen is distinguishable at a glance from *T. assimilis*, by its colors, almost black above, not fulvous; light plumbeous ashy beneath, not pale fulvous; uniform brown of inner webs of quills, and dark axillars, not decidedly paler and fulvous; greater amount of white on the throat; yellow bill; shorter and more rounded wings, etc.

I have been thus detailed in showing the differences between what I consider characteristic specimens of *assimilis* and *leucauchen*, to introduce a series of specimens exactly intermediate between the two, all labelled *assimilis:* 18,564 from Orizaba, by Dr. Sclater; 30,648 from Guatemala, by Mr. Salvin; 22,357, Mexico, by Mr. Verreaux. In 22,351, the size, proportion, and color are more like *leucauchen;* the wings and tail are nearly as dark; the back, however, is greenish-olive; the under parts similar, but paler; the axillars with a little more fulvous; the bill is as yellow. In 18,564, the relationship to *assimilis* is shown by a still lighter tinge above, the axillars almost as fulvous as in *assimilis*. Some dark shaft spots and streaks in the feathers of the breast are indications of a certain degree of immaturity.

The gradation of these specimens between *assimilis*, as described above, and *leucauchen*, is so perfect, that in coloration No. 18,564 would, I think, be referred to the former, and 22,357 to the latter. With this, No. 30,648, from Guatemala, recently received from Mr. Salvin, also agrees quite closely—the axillars only being rather more fulvous.

It is quite possible that these specimens referred to as intermediate forms may, as labelled, all belong to *Turdus assimilis;* while 22,351 may be another species. In this case I must leave the

question to be decided hereafter. Mr. Sclater evidently refers to this intermediate form in P. Z. S. 1859, 370.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,351	40,790	♀	Mexico.	...	Verreaux.	.....
22,357	40,789	..	"	...	"	.....
18,564	..	..	Orizaba, Mex.	...	Dr. Sclater.	Botteri.
30,648	12	..	Dueñas, Guat.	1860.	O. Salvin.	.....
..	6	..	Xalapa.	...	Cab. Lawrence.	D'Oca.

Turdus grayi.

? Merula tristis, SWAINS. Philos. Mag. 1827, 369.—*Turdus tristis*, SCLATER, P. Z. S. 1856, 294; 1859, 330.

Turdus grayi, BON. P. Z. S. 1837, 118.—IB. Conspectus, 1850, 272.—SCLATER & SALVIN, Ibis, I, 1859, 5 (eggs).—SCLATER, Catal. 1861, 4, no. 22.—CABANIS, Journ. for 1860, 323.

? Planesticus luridus, BON. Comptes Rendus, XXXVIII, 1854, 4 (New Grenada).

Turdus casius, BON. Comptes Rendus, XLI, 1855, 657.—*Turdus cæsius*, SCLATER, P. Z. S. 1859, 330.—LAWR. Ann. N. Y. Lyc. 1861, 326 (Panama).

Hab. Mexico (Xalapa, Cordova, Oaxaca); Guatemala (Vera Paz); Costa Rica.

In a rather large series of specimens I find some differences in individuals, which, however, do not appear of specific value, especially as the separation in one character does not correspond with that based on another; nor are there any appreciable geographical relationships. The length of the wing, tarsus, and bill, as well as the color and width of the latter, vary in specimens from the same localities. In some the inner edges of the quills towards their bases are of the same light cinnamon as the inner coverts; this color sometimes sharply defined as a margin. In others, again, this is less distinct; while in some these edges are only of a paler gray, with the faintest trace only of cinnamon, and no margin is traceable.

In most specimens of this bird the edges of the inner webs of the quills towards the base are light cinnamon, like the axillars, forming a conspicuous and well defined edging. In No. 30,646, however (a female bird), this character is almost inappreciable.

No. 30,559, from Acajutla, differs in being larger (length, 10.00; wing, 5.15; tail, 4.80; bill to nostril, .60; tarsus, 1.25). The colors are paler, upper parts more olive, and the inner edges of the quills

only very slightly fulvous, without any well defined edging. This is also the case with some Costa Rica skins.

Mexican specimens seem to have shorter bills than Guatemalan. In all there is a decided bare space behind the eye, less marked, however, especially around the eye, than in *T. gymnophthalmus*. The latter species is otherwise somewhat similar, differing mainly in the absence of the cinnamon tinge to the under parts of the body.

Male and female specimens from Panama, in Mr. Lawrence's collection, exhibit both extremes of coloration of the quills as referred to above.

I do not consider the evidence before me favorable to the separation of *T. cæsius* from the original *grayi;* and therefore, for the present, prefer to unite the two species. *Planesticus luridus*, Bon. Notes Orn. Delattre, 28, New Grenada, probably, as suggested by Sclater, belongs here also.

It is difficult to say to which of the Mexican *Planestici* the *Turdus tristis* of Swainson belongs. His description of "olive brown, beneath whitish; chin with black spots; under wing coverts pale ferruginous; bill and legs brown," really suits *T. leucauchen* better than *grayi*, to which it has generally been referred, but is too far from the truth to admit of being identified with either.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,664	..	..	Xalapa, Mex.	...	P. L. Sclater.	D'Oca.
33,570	165	..	Mirador, Mex.	Nov. 1863.	Dr. Sartorius.	.....
22,359	40,793	♀	Cordova? Mex.	...	Verreaux.	.....
32,686	14,080	♀	Mexico.	...	"	.....
..	9	..	Jalapa. [Guat.	...	Cab. Lawrence.	.....
20,394	1,449	..	Tactic, Vera Paz,·	Jan. 1860.	O. Salvin.	.....
30,646	3,015	♀	Cobau, " [dor.	1861.	"	.....
30,859	..	♂	Acajutla, San Salva-	Aug. 11, '63.	Capt. J. M. Dow.	.....
30,481	17	..	San Jose Costa Rica.	...	Dr. v. Frantzius.	Carniol.
33,260	..	..	"	...	J. Carniol.	.....
33,262	..	..	"	...	"	.....
33,261	147	..	"	...	Dr. v. Frantzius.	.....
..	8	..	Guatemala.	...	Cab. Lawrence.	.....
..	11	♀	Panama.	...	" [1]	.....
..	10	♂	"	...	" [1]	.....

13,664.	4.80; 1.25; 1.05.	Inner edges of quills cinnamon; sharply defined.
33,570.		" " " "
22,359.	4.70; 1.30; 1.10.	" " " "
9	4.70; 1.30; 1.13.	Cinnamon; not sharply defined.
20,394.	4.60; 1.18; 1.15.	" sharply defined.
30,646.	4.80; 1.25; 1.15.	Paler, only a trace of cinnamon.
30,859.	5.15; 1.30; 1.17.	" " "
30,481.	4.75; 1.20; 1.12.	Cinnamon; sharply defined.
8.	4.50; 1.22; 1.10.	" " "
11.	4.40; 1.20; 1.05.	Paler, not edged with cinnamon.
10.	4.85; 1.20; 1.10.	" " "

[1] *T. casius*, Lawr.

Turdus obsoletus.

Turdus obsoletus, LAWRENCE, Ann. N. Y. Lyc. VII, 1862 (♂, Panama).

Hab. Isthmus of Panama.

Male: Second quill between 6th and 7th; 4th and 5th longest. Color above dark brownish olive, deepest on the head; beneath showing a considerably paler shade of the same, but darkest on the sides: throat similar, but with a grayish tinge, the centres of the feathers obsoletely darker. Region about the vent and under tail coverts pure white. Inner wing coverts, axillars, and inner edges of the quills cinnamon rufous. Greater coverts with a spot of cinnamon at the end (an indication of immaturity?). Bill and legs uniform brown.

Length, 8.10; wing, 4.60; tail, 3.80; bill from gape, 1.15, from nostril, .58; tarsus, 1.17; middle toe and claw, 1.15.

I owe the opportunity of examining this species to the kindness of Mr. Lawrence, the description being taken from his type specimen No. 12, collected by Mr. M'Leannan in 1862. The peculiar dark lines crossing the feathers on the back, described by Mr. Lawrence, are purely optical in character, being similar to the watering of silks, etc. The under parts, too, are quite uniform, the edges of the feathers being possibly a little ferruginous.

This species may be the female of one of the black species as suggested by Dr. Sclater, in a letter to Mr. Lawrence; but I am unable to assign it to any of those described, and the bird is marked as a male by Mr. M'Leannan.

Turdus migratorius.

Turdus migratorius, LINN. S. N. 12th ed. 1766, 292.—SCLATER, P. Z. S. 1856, 294; 1859, 331.—IB. Catal. Am. Birds, 1861, 4.—BAIRD, Birds N. Am. 1858, 218.—COOPER & SUCKLEY, P. R. R. R. XII, II, 1859, 172.

Figures: VIEILLOT, Ois. Am. Sept. II, pl. lx, lxi.—WILSON, Am. Orn. I, 1808, pl. ii.—DOUGHTY, Cab. N. H. I. 1830, pl. xii.—AUDUBON, Birds Am. III, pl. 142; Orn. Biog. II, pl. 131.

Hab. The whole of North America; Mexico (Oaxaca, Cordova); Cuba, very rare (Gundlach); Tobago (Kirk).

In highly plumaged specimens from the east the feathers of the inter-scapular region are frequently, even generally, tinged with blackish in their centres, passing gradually into ash on the edges, and the black of the head ceases to be sharply defined. There is also usually a well defined whitish tip, half an inch long, to the outer tail feathers.

In Rocky Mountain skins, the tail is either black except a very narrow whitish edge, or the white tips of eastern specimens are replaced by a dull gray. The black of the head, too, is better defined, the interscapular feathers more uniformly ash, and the upper parts without the faint brownish wash so frequently seen in eastern specimens. There are, however, some exceptions to these features, in the series from each locality. The colors generally of western birds appear to be paler.

It may be proper to state that, while in spring adult specimens the bill is yellow with the extreme tip dusky, in immature, and perhaps winter dress, there is every gradation from this to a uniformly dusky bill. The entire culmen is frequently tinged with brown.

In none of the specimens before me is the head entirely destitute of its brown or blackish color, although the edges of the feathers are frequently so much tinged with ash as greatly to obscure this character.

The bills vary considerably in length—the shortest measuring .50 from tip to nostrils, the average being barely .60.

A specimen from Mirador, Mex. (No. 23,908), agrees generally with skins from the United States, but the throat anteriorly is so closely streaked with black as to exceed the white in amount, this color being restricted principally to the chin.

This species is found throughout the whole of North America, north to the Arctic Ocean, wherever collections have been made, and as far south as the latitude of Vera Cruz. No species are more generally distributed in North America than this bird and *Dendrœca æstiva*. I find no mention of its occurrence south of Mexico.

I mention only the extra limital specimens of the many skins in the Smithsonian collection.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,949	..	..	Mexico.	...	J. Gould.	.....
13,581	..	..	"	...	"	J. Taylor.
23,908	..	..	Mirador, Mex.	...	Dr. C. Sartorius.	.....

Turdus confinis.

Turdus confinis, BAIRD, n. s.

Hab. Todos Santos, Cape St. Lucas.

No. 23,789. Entire upper parts and sides of head and neck uniform grayish ash, with perhaps a faint tinge of olivaceous, less than in eastern specimens of *T. migratorius*. The central portions of the

feathers of the top of head are rather darker than the edges, though almost inappreciably so, and not imparting a general dusky appearance. The chin and throat are white, streaked with ashy brown. The jugulum and breast are pale yellowish buff; the axillars, inner wing coverts and sides of the breast similarly, but rather more decidedly colored. The belly and edges of the crissal feathers are white, the hinder parts of the flanks ashy. There is a distinct whitish stripe from the lores over, and a quarter of an inch behind the eye; the lower eyelid is also white. The tail feathers are worn, but there is an indication of a narrow white tip. The feathers of the jugulum, especially of the sides, are tipped with ashy like the back, as in immature specimens of *T. migratorius*. The greater wing coverts are tipped with dull white. The bill is yellowish; the upper mandible and the tip of lower tinged with dusky. The feet are pale brown.

The length cannot be given accurately, as the skin is much drawn up. The wing, however, measures 5.10 inches, its tip reaching 1.40 beyond the longest secondary; tail, 4.10; tarsus, 1.20; middle toe and claw, 1.07; exposed portion of culmen, .92; from tip to open portion of nostrils, .60.

The specimen with a general resemblance to an immature *T. migratorius* (especially the western variety), in the white superciliary streak and general markings, is much lighter beneath than in any of the many skins of *T. migratorius* before me; there being none of the dark chestnut or cinnamon shade, but rather a light buff; the belly and flanks are much more purely white. The superciliary stripe extends farther behind the eye; indeed in most specimens of *migratorius* the white is nearly confined to the eyelids. The bill and wings are rather longer than usual in *migratorius;* the middle toe, on the other hand, appears shorter.

The specimen lacks entirely the reddish-brown back of *T. flavirostris*, in which latter also the breast and sides are like those of *migratorius*. The white of the belly is even more extended. It has a whitish superciliary streak, entirely wanting in *flavirostris*. The upper part of the jugulum is not streaked. The wings are longer and more pointed, and the primaries extend considerably farther beyond the secondaries. The bills are of the same size; the tarsus is 1.20, or longer than the middle toe and claw; while in *flavirostris* (although a larger bird) the tarsus is only 1.00, and shorter than the middle toe and claw (1.20).

Upon the whole, it may be that the specimen before me represents an abnormal plumage of *T. migratorius;* but its rather different

proportions, much paler ground color beneath, greater extent of white on the belly, absence of black or dusky on the head, etc., leads me to consider it as distinct. Its being a summer bird of Cape St. Lucas is also an additional argument for this view. It is decidedly not to be referred to *T. flavirostris*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,789	..	..	Todos Santos, C. S. L.	Sum. of 1860.	J. Xantus.	J. Xantus.

Turdus flavirostris.

Turdus flavirostris, SWAINSON, Philos. Mag. 1827, 369.—SCLATER, P. Z. S. 1859, 332.

Turdus rufopalliatus, LAFR. Rev. Zool. 1840, 259 (erroneously quoted as from Monterey, Cal.).

Turdus palliatus, BONAP. Conspectus, 1850, 272.

Hab. Western Mexico.

This species appears to be but little known to ornithologists at the present time, none having been obtained by Boucard, Sallè, D'Oca, and other collectors. Mr. Xantus, however, procured numerous specimens, in 1863, about Colima, Mex., which would seem to be its centre of abundance. It appears to vary but little in color with sex and season, and may readily be identified by Sclater's diagnosis.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,864	95	♂	Ist. Tehuantepec.	May 17.	T. C. Martin.	A. J. Grayson.
29,349	104	♂	Colema, Mex.	Jan. 1863.	J. Xantus.	J. Xantus.
29,350	100	♂	" "	"	"	"
29,351	102	♂	" "	"	"	"
29,352	101	♂	" "	"	"	"
29,353	106	♀	" "	"	"	"
29,354	105	♀	" "	"	"	"
30,134	103	♂	" "	"	"	"
30,137	143	♀	" "	Feb. 1863.	"	"
31,818	1,711	♂	" "	Aug. 1863.	"	"

29,349. Length, 8.50. Iris brown.
29,350. " 8.50. " reddish.
29,351. " brown.
29,352. " "
29,353. " "
29,354. Iris brown.
30,134. Length, 8.50. Iris brown.
30,137. " 9.25. " "
31,818. " "

Merula.

Turdus infuscatus.

Merula infuscata, LAFRES. Rev. Zool. 1844, 41.—*Turdus infuscatus*, SCLATER & SALVIN, Ibis, I, 1859, 6.—SCLATER, P. Z. S. 1859, 334, 362.—IB. Catal. 1861, 5 (no. 33).

Hab. Mexico (Xalapa, Oaxaca). Guatemala.

Smithsonian No.	Collector's No.	Sex and age	Locality	When collected	Received from	Collected by
[illegible]	[illegible]	[illegible]	Europa. Vera Paz, Guat.	[illegible]	[illegible]	[illegible]

Turdus rufitorques.

Turdus rufitorques, Hartlaub, Rev. Zool. 1844, 354.—Scl., P. Z. S. 1859, 354; Ibis, II, 1860, 29; Cassin, 1862, t. xx, fig. 16.

Hab. Guatemala. Dyeing.

Smithsonian No.	Collector's No.	Sex and age	Locality	When collected	Received from	Collected by
[illegible]	[illegible]	♂	Dueñas, Guat.	Aug. 1, 1859	[illegible]	[illegible]

Hesperocichla.

Turdus nævius.

Turdus nævius, Gm. S. N. I, 1788, 817.—Swainson, P. Z. S. 1837, 4; 1838, 121.—Baird, Birds N. Am. 1858, 7.—Cooper & Suckley, P. R. R. XII, ii, 1859, 172.

Orpheus meruloides, Rich. F. B. A. II, 1831, 187, pl. xxxviii.

Other figures: Vieillot, Ois. Am. Sept. II, 1807, pl. lxvi.—Aud. Orn. Biog. IV, 1838, pl. 349, and 433.—Ia. Birds Am. III, pl. 145.

This species is not recorded as found elsewhere than on the northwest coast of America, from California northward to Russian America. Richardson obtained a single specimen on Great Bear Lake, described as *Orpheus meruloides*; and Mr. Kennicott found another in the Rocky Mts., on Porcupine River (No. 27,221, August 28, 1861, collector's number 1,612).

It is proper to state that the specimen collected by Mr. Kennicott (of which only the head and wing were preserved) exhibits a decided notch in the bill. Nothing approximating to this character, however, could be discerned in over fifty other specimens examined; in all of which, if any indication of notch existed, it was of the most obsolete character, and was, in most instances, not to be found at all.

PLATYCICHLA, Baird.

Platycichla, Baird, n. g. (Type *P. brevipes*.[1])

Among the South American Thrushes in the Museum of the Smithsonian Institution is one (No. 23,954) for which I am unable

[1] *Platycichla brevipes*, Baird. The upper parts are greenish-olive, with an appearance of darker edges to the feathers of the head and back. The under

to find a name generic or specific, and which differs so very considerably from any other I have met with as to be well entitled to a new generic appellation. It was obtained by Dr. G. R. Horner, U. S. N., during the cruise of the Delaware many years ago, on the coast of South America, probably in Brazil. Two specimens similar to it are in the Philadelphia Academy. This may possibly be the *Cichlopsis leucogenys*, Cab. Mus. Hein. 1850, 54, or an allied species; but I cannot reconcile it with the description of either genus or species by Cabanis.

With the general appearance of a *Planesticus*, it differs markedly in having a short and very broad deeply cleft bill, much depressed at the base, and with moderate bristles. The diameter of the jaw across the base of lower mandible is .42, much greater than the length of gonys (.31), and at least equal to the distance from nostrils to end of bill, very different from what it is in *Turdus migratorius*. The feet are weak. The tarsi are very short, being less than the middle toe and claw; they are booted, or without transverse divisions. The wings and tail are much as in *Turdus migratorius*.

In external form this bird exhibits quite an approach to the *Ampelidæ*, especially to *Myadestes*, although evidently a Thrush; but its short broad bill and weak feet, with short tarsi, distinguish it from all others.

SEMIMERULA, Sclater.

Semimerula, Sclater, P. Z. S. 1859, 332. (Type *Turdus gigas*.)

Size large. Wings rather short and rounded, decidedly, but not considerably longer than the tail, which is slightly rounded. First quill in *T. gigas* nearly one-half the 2d, in *aurantius* two-fifths; 2d about equal to the 8th, or shorter than 7th; 5th longest. Bill large, in some specimens as long as the head. Legs stout and strong. Tarsi decidedly longer than the head. Color dusky all over. Sexes similar.

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parts the yellowish-olive; crissum paler; the middle of belly and anal region whit[illegible]ash; the throat feathers with shaft streaks and arrow spots of dusky, obs[illegible]y indicated on the jugulum; under wing coverts cinnamon; middle cov[illegible]with an occasional cinnamon spot. Total length, 8.40; wing, 4.45; tai[illegible]; exposed portion of first primary, .95; of second, 3.05; of longest (fi[illegible] measured from exposed base of first primary), 3.30; *bill:* length fr[illegible]rehead, .80; from nostril, .43; along gape, .95; width of gape, .55; le[illegible]arsus, .95; middle toe and claw, 1.00; claw alone, .29; hind toe and cl[illegible].68; claw alone, .35.

3 July, 1864.

Among the species of *Turdus*, of Dr. Sclater, I find in his section *Semimerula* a group which, in its characters, differs so widely from *Turdus* and *Merula* proper, that I cannot help considering it of generic rank. At one end of the section is Dr. Sclater's type, *T. gigas* of Ecuador, in which the wings differ most from *Turdus* in being broad and much rounded; the 1st primary very large, and almost half the 2d, which about equals the 8th—the 6th quill longest. The bill is shaped like that of *T. migratorius*, but rather larger. The legs are stout and strong. In *T. aurantius* the wings are rather more pointed, but considerably less so than in *T. migratorius*. The lengthened tarsi, considerably longer than the head, form a conspicuous feature. The general appearance of *aurantius* is very like that of *Mimocichla*, the principal apparent difference being in the shorter and less rounded tail. The style of coloration, too, is much the same.

Mr. George R. Gray places *Cichlopsis*, of Cabanis, among the Thrushes, with *T. aurantius* as the type. The true type, however, is *Turdus leucogenys*, Licht. Berlin Mus., which is generically very different from the *Turdus leucogenys*, Latham (=*T. aurantius*, Gr.).

Semimerula aurantia.

Turdus aurantius, Gm. Syst. Nat. I, 1788, 832.—Sclater, P. Z. S. 1859, 333.—Ib. Catal. Am. Birds, 1861, 6, no. 37. (*Semimerula.*)

Turdus leucogenys, Latham, Ind. Orn. I, 341.—Gosse, Birds Jam. 1847, 136.—Ib. Illust. no. 23.

Hab. Jamaica.

The sexes do not appear to differ in this species, although the bills vary greatly in size. Thus in 24,340, ♂, the bill measures .60 from tip to nostril; while in 22,142, ♀, it measures .75, with the same width at base or even rather narrower. Thus, as in other large Thrushes, I find that the bill varies considerably in size, although the average in a large number of specimens may furnish good specific characters.

A young bird exhibits nothing of the spotted plumage of the immature North American Thrushes, differing from the adult merely in a wash of ferruginous on the under side, as well as on the top of head and back.

Measurement of 24,340, ♂: Length, 10.00; wing, 4.80; tail, 4.35; bill from head, 1.00, from nostril, .60, from gape, 1.20; 1st primary, 1.10; 2d primary, 3.20; tarsus, 1.54; middle toe and claw, 1.28.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,670	..	..	Jamaica.	...	Dr. Sclater.	.....
23,302	..	♂ Juv	Trelawney, Jam.	July 9, '59.	"	W. Osburn.
22,140	..	♂	Spanishtown, Jam.	...	W. Thos. March.	.....
22,141	..	♂	"	...	"	.....
22,142	..	♀	"	...	"	.....
22,143	..	..	" [Jam.	...	"	.....
24,340	28	♂	Goshen, St. Annes,	Oct. 10, '61.	"	.....

MIMOCICHLA, Sclater.

Mimocichla, Sclater, P. Z. S. 1859, 336. (Type *Turdus rubripes*, Temm.)

Form.—Bill large, about as long as the head, without apparent notch in some species. Rictal bristles inconspicuous, those near the angle of the mouth reaching scarcely more than half way to the nostrils. Tarsi lengthened, equal to the middle toe and two lengths of its claw, either entirely smooth (or "booted") anteriorly, or with obsolete indications of scutellæ on the exterior face. Wing a little shorter than the tail, rather pointed; the 1st primary large, broadly falcate, more or less obtuse, and contained from two and a half to three times in the 2d primary, which is nearly equal to the 8th quill; the 4th and 5th quills longest, the 3d and 6th little shorter. Tail somewhat graduated; the lateral feathers about three-quarters of an inch shorter. A naked ring round the eye.

Color.—In the four species known to me the prevalent color is a uniform slaty or plumbeous, as in the Cat-bird (*Mimus carolinensis*). The extreme chin is white, the throat with a black patch, either uniform or interrupted with white. The lores and space beneath the eye blackish. The lateral tail feathers have a terminal patch of white on their under surface for nearly half the exposed length, obscured on the outer web by a plumbeous tinge on the upper surface. All the feathers of wings and tail black, the former with the exposed or outer surface margined broadly with plumbeous in abrupt contrast (the black shows externally on the ends of the quills). First and 2d quills black, without external margin. Tail feathers margined at the base.

The species may be thus distinguished:—

Bill black; whole under parts, including vent and crissum, uniform slaty . . . . . *plumbea.*

Bill reddish-black; under parts plumbeous, except vent and crissum, which are white . . . . . *schistacea.*

Bill reddish-black; beneath plumbeous; lower abdomen and thighs cinnamon red; crissum white . . . . *rubripes.*

Bill yellow; breast light cinereous, shading into a white abdomen and crissum; throat white, with narrow central streaks of black (in all others uniform black) . . *ardosiacea.*

This genus—a strongly marked one among the American Thrushes—is confined to the West India Islands, and may possibly include more species than those here enumerated. These have been in a state of much confusion until disentangled by the discovery, on the part of Dr. Bryant, of the true *T. plumbeus*, of Linnæus, as shown by him in his paper presented to the Boston Society of Natural History.

Mimocichla plumbea.

Turdus plumbeus, LINN. Syst. Nat. ed. X, 1758, 169, not of ed. XII, 1, 294 (except reference to CATESBY), nor of GMELIN, 814, 12, which does not belong to the series at all, being a mixture of different forms.

Mimus rubripes, BRYANT, Pr. Bost. Soc. VII, 1859, 114. (Blue Jay and Blue Thrasher of inhabitants.)

Mimokitta plumbea, BRYANT, Pr. Bost. Soc. N. H. 1863.

Turdus viscivorus plumbeus, CATESBY, Carol. I, tab. XXX.

Hab. Bahamas.

Bill from base of skull about as long as the head. No indication of a terminal notch, or at best a very faint one. Commissural edge of upper jaw straight as far as the nostrils, then concave to the tip. Bristles about gape very short and inconspicuous, those at the angle of the mouth extended forward, reaching only half way to the nostrils. A narrow membranous ring round the eye, with a small naked space behind.

Tarsi lengthened, rather more than equal to one and a quarter times the length of middle toe and claw. Scutellæ indistinctly evident, almost obliterated and fused together, most distinct on the external face, eight in number to the base of middle toe. Outer lateral toe and claw the longer, reaching to base of middle claw, about equal to the hind toe and claw.

Tail graduated; lateral feathers .60, shorter than the middle ones. Wings a little shorter than the tail, moderately rounded; 4th and 5th quills longest; 3d and 6th little shorter; 2d intermediate between 7th and 8th, .45 shorter than the longest; 1st quill with its exposed surface one-third the length of the 2d, slightly falcate, broadest in the middle, but with the sides about parallel to the end, where it is obliquely truncate with the corners rounded.

General color slaty gray (like that of *Mimus carolinensis*), including crissum, tibiæ, inner wing coverts, etc.; rather lighter beneath. Feathers of crown with concealed dark central streaks. Lores, space beneath the eye, fading out behind and a broad square patch on the chin and throat widening a little behind, black, without any edging of white. Space between the rami of lower jaw, and a patch on its outer side white; the latter duller in color and continued beneath the eye, becoming more plumbeous, and forming an indistinct line of separation between the black of throat and that below the

eye. Wings and tail black, the coverts and outer edges of the quills light hoary plumbeous, margining and abruptly contrasting with the general black (1st and 2d primaries not margined). Rather more than the terminal fourth (1.20 inches) of lateral tail feathers with a white patch, the portion on the outer web plumbeous; this patch diminishes in size on the others until on the two inner on each side it forms only a slight plumbeous tip. The bill is black; the legs reddish.

Tarsus, 1.40; middle toe and claw, 1.10; claw from base, .30; bill from base of head, 1.09, from nostrils, .61; commissure, 1.10; wing, 4.68; tail, 5; 1st quill, 1.00 long, .20 wide.

As shown by Dr. Bryant, this is the true *Turdus plumbeus* of Linnæus, based upon the *Turdus viscivorus plumbeus* of Catesby (I, pl. xxx), a Bahama bird not recognized by naturalists until the visit of Dr. Bryant to the Bahamas, in 1859. In the 10th edition Linnæus confines his citations entirely to Catesby; in the 12th, he includes Brisson's description of *Merula americana cinerea*, a different species. In their endeavors to find in Catesby's bird one or other of the species belonging to the West Indies, authors found a great stumbling block in the black bill represented in his figure and description; and Vieillot insists that Catesby must have been in error. This is, however, one of the most strongly marked characteristics of the species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
33,168	15	♀	Nassau, N. P.	Ap. 22, '64.	Lt. Fitzgerald.	.....
..	..	..	"	...	Cab. Dr. Bryant.	.....

33,168. Legs, inside of bill, and iris orange red; bill black.

Mimocichla schistacea.

Mimocichla schistacea, BAIRD, n. s.

(17,713.) Bill very large and stout, about as long as the head; commissure very nearly straight. Bill decidedly notched. Rictal bristles short; not reaching as far forward as the nostrils. Legs stout; tarsi longer than middle toe and claw; no indication of scutellation anteriorly. Wings rather shorter than tail; 1st primary much developed, almost half the 2d, broad-falcate, rather pointed. Tail somewhat graduated; lateral feathers .70 shorter than central.

Color dark plumbeous, scarcely paler on the rump. Centres of feathers of head and back darker (concealed). Tibiæ plumbeous, vent and crissum white. A broad patch on throat extending to the jugulum, lores, and space beneath the eye, black; chin and short stripe along the side of lower jaw, with concealed basal edges of the throat feathers, white. Tail feathers with a terminal white patch, largest externally, and diminishing to the central

ones. Wings and tail black. Outer edges of wing feathers, except 1st and 2d primaries, and of tail feathers at the base, plumbeous. Bill in skin reddish-black; legs apparently reddish. Iris in life light brown.

Length of skin, 10.50; wing, 5.00; tail, 5.10; longest quill, .50 longer than 2d; 1st quill 1.55 long, .20 wide; 2d, 3.40; bill from forehead, 1.20, nostril, .71; commissure, 1.31; tarsus, 1.50; middle toe and claw, 1.31, claw alone, .30; hind toe and claw, .81.

I have not been without a suspicion that this bird might be the *M. rubripes*, without any reddish on the belly. In view, however, of the close resemblances among the West India species, and certain apparent differences of form, I am more inclined to the opinion that they are distinct. The size is about the same, but the bill is conspicuously larger and heavier: middle and hind toes longer, with their claws longer; the 1st primary longer. There is none of the cinnamon red of the belly; the plumbeous of the belly extends farther down to the vent, and includes the flanks and tibiæ. The general color of the body is much darker, and the rump is scarcely lighter than the back.

It is, however, proper to state that, while two of the three specimens before me are as described, a third (No. 17,112) shows but little plumbeous on the thighs, which are of a dirty whitish. Both the Monte Verde birds, nevertheless, were killed in May, and are apparently in full plumage, and none were met with having cinnamon colored bellies. In a large collection of the true *rubripes*, from another part of Cuba, all the individuals were fully marked, as above indicated, with cinnamon red.

One specimen of this bird is in the museum of the Philadelphia Academy.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,112	..	..	Monte Verde, Cuba.	May 6.	Chas. Wright.	.....
17,113	..	♂	"	...	"	.....

(17,112.) Length, 10.25. (17,113.) Length, 10.00.

Mimocichla rubripes.

Turdus rubripes, Temm. Pl. Col. 409.—Vigors, Zool. Jour. III, 1827, 439.—De la Sagra, Cuba, Ois. 1839, 46, pl. iv.—Gundlach, Boston Jour. VI, 1853, 318.—*Mimus rubripes*, Bp. Consp. 276.—*Galeoscoptes rubripes*, Cab. Mus. Hein. 1850, 82.—Ib. Journ. III, 1855, 470.—Sclater, P. Z. S. 1859, 336.—Ib. Catal. Am. Birds, 1861, 6, no. 40 (*Mimocichla*).

Hab. Cuba.

(31,978.) Bill from base of skull about as long as the head, with a distinct terminal notch. Rictal bristles short; those at the angle of mouth reaching scarcely more than half way to the nostril. A distinct membranous ring round the eye.

Tarsi lengthened. No traces of scutellæ in most specimens; the faintest possible (perhaps fallacious) indications in others.

Wings rather rounded, shorter than the tail; 4th and 5th quills longest; 2d between 7th and 8th; 1st quill slightly falcate, rather obtuse at the end, contained a little more than two and a half times in the 2d quill. Tail moderately graduated; lateral feathers .70 shorter than central.

General color slaty or plumbeous gray, darker on the back and head. Lores, space beneath the eye and extending on the ears, and a large patch on the throat, black; chin, and a short patch from the side of lower jaw as far back as its articulation, together with the concealed bases of the black throat feathers, white. Posterior part of belly and flanks, with the tibia, light cinnamon red. Crissum and terminal half of exposed surface of tail white. Wing and tail feathers black, except as described, abruptly margined externally with plumbeous (in the latter on the concealed bases of the feathers). Legs apparently red in life, fading into yellowish. Bill in the dried skin dusky, possibly in life of a dark reddish color.

Length, 10.20; wing, 5.00; tail, 5.20; longest quill, .60 longer than the 2d; 1st 1.25 long, .21 wide; tarsi, 1.50; middle toe and claw, 1.12; claw alone, .28; bill from forehead, 1.08; nostrils, .65; gape, 1.25.

In a considerable number of specimens before me I find quite a variation in size (No. 31,979 measuring 9.20, wing, 4.75), with but little in form; the 1st primary is sometimes rather smaller in proportion than as described. The colors, too, are very constant.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,816	..	..	Cuba.	...	S. F. Baird. Dep.	.....
31,978	..	..	"	...	J. Ashhurst.	.....
31,979	..	..	"	...	.....	.....

Mimocichla ardosiacea.

Turdus plumbeus, LINN. Syst. Nat. ed. XII, I, 1766, 294 (not of 10th ed. excl. reference to CATESBY).—VIEILLOT, Ois. Am. Sept. II, 1807, 2, pl. lviii.—IB. Nouv. Dict. XX, 1818, 242.—*? Galeoscoptes plumbeus*, SALLE, Pr. Z. S. 1857, 231.—*Galeoscoptes* (*Mimocichla*) *plumbeus*, SCLATER, P. Z. S. 1859, 336.

Turdus ardosiaceus, VIEILL. Encyclop. Méth. II, 1823, 648 (St. Domingo).

Le Merle cendré d'Amérique, BRISSON, Ornithol. II, 1760, 288 (St. Domingo).

Hab. St. Domingo.

Bill from base of skull shorter than the head. Lower edges of upper jaw straight to the middle, and then scarcely curved to the tip where there is a

very slight notch. Bristles at base of bill very inconspicuous. But a slight indication of the conspicuous membranous ring around the eye of *puamilus*.

Tarsi long, about one and a third times the length of middle toe and claw. Scutellæ visible on the exterior side, but the edges there fused: seven discernable to the base of the toes (one less than in *puamilus*). Outer lateral toe the longer.

Tail graduated: the feathers rather obtusely pointed: the lateral about half an inch shorter than the central. Wings a little shorter than the tail, moderately rounded: 5th quill longer than 4th, 6th, and 3d: 2d between 7th and 8th; 1st quill falcate, broadest in the middle, but pointed (not obtuse, as in *plumbeus*): exposed portion 1.14 in length, .21 in breadth, contained three times (or one-third) in the length of the 2d.

General color rather dark plumbeous gray above and on the inside of wings and axillars. Beneath with the jugulum, upper part of breast, and flanks light ashy gray, passing insensibly into the almost pure white of the middle of the belly, anal region, and crissum. Tibiæ plumbeous. Throat and chin white, with narrow V-shaped streaks of black on the central third of the feathers, which extend a little into the ashy of the lower throat. Loral region and space beneath the eye dusky. An indication of a white streak from the side of lower jaw, margined below by a rather continuous line of black. Wings black, with their upper exterior exposed surface abruptly like the back, but lighter. Tail black, with a terminal patch of white on the outer feather (*about* 1.20), becoming less on the others, the posterior edge nearly transverse; the upper surface on the outer webs dark plumbeous. Bill and feet apparently bright yellow, perhaps faded from red.

Bill from base of skull, 1.14; from nostril, .70; gape, 1.34; tarsi, 1.55; middle toe and claw, 1.15; claw alone, .31; wings, 5.20; tail, 5.25.

The only specimen I have seen of this species is in the museum of the Academy of Natural Sciences of Philadelphia, where it is labelled "*T. plumbeus*, South America."

In form this species exhibits a close resemblance to *M. plumbea*; but the colors are very different. The bill is yellow, not black, and instead of a uniform slaty gray over the whole body above and below, including the crissum, the middle of the belly, vent, and crissum are white. Instead of a uniform square black patch on the throat, this has white as its predominant color, with narrow central streaks of black.

Vieillot figures and describes this bird quite accurately and unmistakably, giving it as an inhabitant of the Antilles; but his accounts are evidently based on the species as observed in St. Domingo, and to which it may possibly be confined. The specimen belonging to the Academy has no indication of locality other than "Amer.-Mérid."

Vieillot gives the bill and feet as red.

RAMPHOCINCLUS, LAFRESNAYE.

Ramphocinclus, LAFR. R. Z. 1843, 66. (Type *Turdus brachyurus*, VIEILL.)

Bill longer than the head, notched; culmen and commissure considerably decurved from the base; gonys slightly so. Rictus with short bristles. Tarsus lengthened, longer than the head or the middle toe; the scutellæ fused into one plate, or faintly indicated. Wings rather pointed, longer than the tail; 1st primary more than half the longest; 2d about equal to the 9th. Tail rounded, the lateral feather graduated; the feathers generally rather narrow, with quite narrow outer web.

This interesting genus is well marked among its fellows, and will readily be recognized The single species in pattern of coloration closely resembles *Melanotis hypoleucus*, and should perhaps be placed very near it, having sooty brown where the other has blue. It differs, however, in much more curved, and longer bill; shorter, narrower, and less rounded tail, with narrower outer webs, etc.

Ramphocinclus brachyurus.

Turdus brachyurus, VIEILL. Nouv. Dict. XX, 255.—IB. Encycl. Méth. 1823, 655.—*Ramphocynclus brachyurus*, LAFR. R. Z. 1843, 66.—SCLATER, P. Z. S. 1859, 338.—IB. Catal. 1861, 7, no. 44.—*Cinclocerthia brachyura*, SCLATER, P. Z. S. 1855, 213.

Zoothera cinclops, BP. Consp. 259.

Total length, 8.00; wing, 4.00; tail, 3.50; graduation, .45; outer web of lateral feathers one-fourth the inner; exposed portion of 1st primary, 1.60; of 2d, 2.50; of longest (measured from exposed base of 1st primary), 3.00; length of bill from forehead, 1.15, from nostril, .70; along gape, 1.34; tarsus, 1.20; middle toe and claw, 1.00; claw alone, .30; hind toe and claw, .72; claw alone, .37.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,690	46,887	♂	Martinique.	...	Ed. Verreaux.	.....

MARGAROPS, SCLATER.

Margarops, SCLATER, P. Z. S. 1859, 335. (Type *Turdus fuscatus*, VIEILL.)
Cichlalopia, BON. R. Z. 1857, 205, not of C. R. 1854, XXXVIII, 1 (which was based on *Turdus vulpinus*, HART. = *Rhodinocincla rosea*).

Bill very large and stout, with a distinct notch; longer than the head; culmen curving gently from base, and more abruptly towards tip; commissural edge of upper jaw also much curved, so that the whole lower jaw, except at the base, falls inside of the chord connecting the two ends of the arc. Rictal bristles short, and scant; more so than in *Mimocichla*.

Wings rounded; the inner secondary quills apparently uncommonly long; 4th quill longest, next 3d and 5th; 2d between the 6th and 7th; 1st quill more than half the 2d, broad and rather falcate; 2d quill .70 shorter than 4th.

Tail rather shorter than wings, rounded; the lateral feathers half an inch shorter than the central ones.

Legs short and stout; tarsus barely longer than middle toe and claw; distinctly scutellate over anterior half of circumference, the plates well defined, and six or seven in number; claws all very stout and much curved, almost like those of a Woodpecker; hind toe and claw decidedly longer than the lateral.

Margarops fuscatus.

Turdus fuscatus, VIEILLOT, Ois Am. Sept. II, 1806, 1, pl. lvii, *bis*.—IB. Encyclop. Méth. II, 1823, 639.—*Cichlerminia fuscata*, NEWTON, Ibis, 1859, 141, eggs, pl. xii, fig. 8 (Sta Cruz).—CASSIN, Pr. A. N. S. 1860, 376 (St. Thomas).—*Margarops fuscatus*, SCLATER, Pr. Z. S. 1859, 335.—IB. Catal. 1861, 6, no. 38.

Colluricincla fusca, GOULD, P. Z. S. 1836, 6 (see NEWTON, Ibis, 1859, 142).

Hab. St. Domingo and Porto Rico (Vieill.); St. Thomas; Santa Cruz (Newton).

Length (of 30,405), 11.40; wing, 5.20; bill from head, 1.30; nostril, .78; gape, 1.50; tarsus, 1.41; middle toe and claw, 1.30; claw alone (chord), .35; hind toe and claw, .95.

Iris pearly white; bills varying much in size; eggs blue (Newton).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,405	..	..	St. Thomas.	...	Acad. Nat. Sciences.	R. Swift.
30,406	..	..	"	...	"	"
	14	..	"	...	Cab. Lawrence.	"

OREOSCOPTES, BAIRD.

Oreoscoptes, BAIRD, Birds N. Am. 1858, 346. (Type *Orpheus montanus*, TOWNS.)

Bill shorter than the head, without distinct notch. Bristles prominent, their tips reaching beyond the nostrils. Wings pointed, equal to, or a little longer than the tail. First quill not half the second, about two-fifths the longest; 3d, 4th, and 5th quills equal and longest; 2d between 6th and 7th. Tail but slightly graduated; the feathers narrow. Tarsus longer than middle toe and claw by an additional claw; scutellæ distinct anteriorly.

Only one species is at present known of this genus.

Oreoscoptes montanus.

Orpheus montanus, TOWNSEND, Jour. Acad. Nat. Sci. Phila. VII, II, 1837, 192.—AUD. Birds Amer. II, 1841, 194, pl. 139.—*Turdus montanus*, AUD. Orn. Biog. IV, 1838, 437, pl. 369, fig. 1.—*Mimus montanus*,

BONAP. Consp. 1850, 276.—*Oreoscoptes montanus*, BAIRD, Birds N. Amer. 1858, 347.—SCLATER, P. Z. S. 1859, 340.—IB. Catal. 1861, 8, no. 30.

Hab. Rocky Mts. of United States, west to Pacific, south to Cape St. Lucas.

Specimens from Cape St. Lucas, as usual, are smaller than more northern ones.

A young bird from Ft. Bridger is precisely like the adult, differing only in having the edges of the dorsal feathers lighter, causing a streaked appearance. The wings and tail are considerably darker than in an adult.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
8,251	213	..	Fort Laramie.	Sept. 28, '57.	Dr. J. G. Cooper.	.....
8,821	..	♀	Black Hills.	...	Lt. Warren.	Dr. Hayden.
11,070	..	♂	Fort Bridger.	April 18, '58.	C. Drexler.	.....
19,226	21	..	Rattlesnake Hills.	May 16.	Capt. Reynolds.	Dr. Hayden.
19,347	..	..	Willow Springs.	May 14.	"	G. H. Trook.
13,309	39*	♂	Kobe Valley, Utah.	May 22, '59.	Capt. Simpson.	C. S. M'Carthy.
13,308	30	♀	S. Fork of Humboldt.	May 19, '59.	"	"
12,446	..	♂	Zuni Mts.	Sept. 26, '57.	Capt. Sitgreaves.	Dr. Woodhouse.
11,531	68	♂	Lower Colorado.	...	Lt. J. C. Ives.	Mollhausen.
11,532	48	♂	Fort Yuma.	...	"	"
8,143	..	♀	Los Angeles.	...	Lt. Williamson.	Dr. Heermann.
8,129	..	♂	"	...	"	"
25,791	3,348	♂	Cape St. Lucas.	Nov. 5, '59.	John Xantus.	.....
32,164	2,429	♂	"	Nov. 11, '59.	"	.....

11,531. Iris yellow. 32,164. Length, 8.60. Iris orange.

HARPORHYNCHUS, CABANIS.

Toxostoma, WAGLER, Isis, 1831, 528. (Type *T. vetula*, WAGL., not *Toxostoma*, RAF. 1816.)

Harpes, GAMBEL, Pr. A. N. S. Phila. II, 1845, 264. (Type *Harpes redivivus*, GAMB., not of GOLDFUSS, 1839.)

Harporhynchus, CABANIS, Archiv f. Naturg. 1848, *i*, 98. (Type *Harpes redivivus*, GAMB.)

Bill from forehead as long as, or much longer than the head; becoming more and more decurved in both jaws as lengthened. No indication of a notch. Rictus with the bristles extending beyond the nostrils. Tarsus long and stout, appreciably exceeding the middle toe and claw, strongly scutellate anteriorly. Wings considerably shorter than tail, much rounded; the 1st quill more than half the 2d; 4th or 5th longest. Tail large, much graduated; the feathers firm.

There are few genera in Ornithology where the difference in the comparative length and shape of the bill is so great in the different species; and yet the transition from the short straight form in *H. rufus* to the very long and much decurved one in *H. redivivus* is

so gentle that few persons would ever think of separating them generically. Even in individual specimens of the long billed species there is much difference in this respect, showing that so far from furnishing generic characters, it is not entirely available even for specific indications.

Harporhynchus rufus.

Turdus rufus, LINN. Syst. Nat. 10th ed. 1758, 169, based on CATESBY, tab. 19.—IB. Syst. Nat. I, 1766, 293.—*Harporhynchus rufus*, CAB. Mus. Hein. 1850, 82.—BAIRD, Birds N. Am. 1858, 353.—SCLATER, P. Z. S. 1859, 340.—IB. Catal. 1861, 8, no. 48.—*Mimus rufus*, PR. MAX. Cab. Jour. 1858, 180.

Figures: VIEILLOT, Ois. Am. Sept. II, pl. lix.—WILSON, Am. Orn. II, pl. xiv.—AUD. Orn. Biog. pl. cxvi.

Hab. United States, east of Rocky Mts., north to Lake Winnipeg.

In the "Birds of North America" I have called attention to the fact of the larger size, with disproportionately longer tails, and rather more curved bills of specimens from the high plains beyond the Missouri River.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,377	..	♂	Carlisle, Pa.	April 22, '44.	S. F. Baird.	S. F. Baird.
2,261	..	♀	"	May 16, '45.	"	"
12,182	..	♂	Washington.	May 1, '59.	C. Drexler.	.....
32,284	..	♂	Macon, Ga.	March, 1848.	Prof. Jos. Leconte.	.....
6,948	..	..	Ft. Garry, Red Riv.	...	Donald Gunn.	.....
32,392	..	..	"	...	"	.....
4,433	..	..	Quasquiton, Iowa.	...	E. C. Bidwell. [son.	.....
13,311	8	..	Fort Leavenworth.	...	Capt. J. H. Simp-	C. S. M'Carthy.
8,292	..	..	Independence, Mo.	May 26, '57.	W. M. Magraw.	Dr. Cooper.
8,819	..	..	Loup Forks.	Aug. 6.	Lt. Warren.	Dr. Hayden.
5,263	..	♂	Fort Lookout.	June 22, '56.	"	"
5,652	357	..	Republican Fork.	Sept. 26, '56.	Lt. Bryan.	W. S. Wood.
19,346	..	..	Stinking R., Sage [Creek.	June 13, '60.	Capt. Reynolds.	G. H. Trook.

(1,377.) 11.20. (2,261.) 9.75. (8,292.) 12.75. Iris orange. (8,819.) 12.00. Iris yellow.

Harporhynchus longirostris.

Orpheus longirostris, LAFR. R. Z. 1838, 55.—IB. Mag. de Zool. 1839, Ois. pl. i.—*Toxostoma longirostre*, CAB. Wiegm. Arch. 1847, I, 207.—*Mimus longirostris*, SCLATER, P. Z. S. 1856, 294 (Cordova).—*Harporhynchus longirostris*, CAB. Mus. Hein. 1850, 81.—BAIRD, Birds N. Am. 1858, 352, pl. lii.—SCLATER, P. Z. S. 1859, 339.—IB. Catal. 1861, 8, no. 47.

Hab. Eastern Mexico; north to Rio Grande, Texas.

Among the specimens before me is one (28,030) from Mirador, Mexico, which differs from the rest in rather deeper rufous above;

the feathers of crissum rufous, edged with pale brownish-yellow (instead of their being dirty white). The bill is very different, being longer, slenderer, more pointed towards the end, and more gently decurved than that of *H. curvirostris*. Its dimensions are as follows: From forehead, 1.40; from gape, 1.52; from nostril, 1.00, measured with dividers. In 4,016, from Brownsville, the measurements are: From forehead, 1.25; from gape, 1.32; from nostril, .83.

Without more specimens to establish a permanent difference in these respects, I do not feel at liberty to suggest a difference of species, especially as the skin referred to belongs to the region inhabited by typical *H. longirostris*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,016	1	♂	Brownsville, Tex.	...	Lt. D. N. Couch.	.....
8,139	..	..	Lower Rio Grande.	Sept. 1853.	Major Emory.	A. Schott.
22,390	29,742	♂	Mexico.	...	Verreaux.	.....
32,460	93	..	Orizaba, Mex.	...	Prof. Sumichrast.	.....
? 28,030	30	..	El Mirador, Mex.	...	Dr. C. Sartorius.	.....
..	20	..	Xalapa.	...	Cab. Lawrence.	D'Oca.

(4,016.) 10.25. Eyes brownish-yellow. (28,030.) Long billed variety.

Harporhynchus curvirostris.

Orpheus curvirostris, SWAINSON, Philos. Mag. 1827, 369 (eastern Mexico). —M'CALL, Pr. A. N. Sc. May, 1848, 63.—*Mimus curvirostris*, GRAY, Genera, 1844–49.—*Toxostoma curvirostris*, BONAP. Conspectus, 1850, 277.—SCLATER, P. Z. S. 1857, 212.—*Harporhynchus curvirostris*, CAB. Mus. Hein. I, 1850, 81.—BAIRD, Birds N. Am. 1858, 351, pl. li.—HEERMANN, P. R. R. Rep. X, Parke's Rep. 1859, 11.—SCLATER, P. Z. S. 1859, 339.—IB. Catal. 1861, 7, no. 46.

Pomatorhinus turdinus, TEMM. H. Col. 441.

? Toxostoma vetula, WAGLER, Isis, 1831, 528.

Hab. Mexico, from the United States line, southward (Oaxaca, Cordova, Orizaba, Mirador); Mazatlan; Colima.

Specimens from Mazatlan and Colima differ from those in the collection from eastern Mexico, in having heavier and thicker bills, and perhaps stouter legs. In 31,819, the height of the bill at the nostrils is .28 of an inch, while in 4,023 it is .26—both being females. The wing in 31,819 is longer and more pointed than usual, measuring 4.50. I, however, cannot think that there is any specific difference: a large number of specimens from either side of Mexico probably exhibiting the same variations.

The specimen, No. 8,128, mentioned on page 352 of the Report

on Birds as differing from the others in the collection, still remains quite unique in reference to some characters.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,023	24	♀	Brownsville, Tex.	Feb. 1853.	Lt. D. N. Couch.	.....
7,200	..	♂	Ringgold Barracks, Tex.	...	Maj. W. H. Emory.	J. H. Clark.
7,101	..	..	Eagle Pass, Tex.	...	"	A. Schott.
4.022	..	♀	Tamaulipas, Mex.	1853.	Lt. Couch.	.....
? 8,128	..	..	New Mexico.	...	Lt. J. G. Parke.	Dr. Heermann.
23,783	..	..	Mazatlan, Mex.	1861.	J. Xantus.	.....
31,819	1,001	♀	Mts. of Colima.	June, 1863.	"	.....
18.568	..	..	Eastern Mexico.	...	P. L. Sclater.	.....
22,391	17,363	♂	"	...	Verreaux.	.....
..	19	..	Orizaba, Mex.	...	Cab. Lawrence.	.....

(4,023.) 10.00. (7,200.) 11.50. (4,022.) 10.00. Eyes yellow. (31,819.) 11.00. Iris orange.

Harporhynchus cinereus.

Harporhynchus cinereus, XANTUS, Pr. A. N. Sc. 1859, 298.—BAIRD, ib. 303.—SCLATER, Catal. 1861, 8, no. 49.

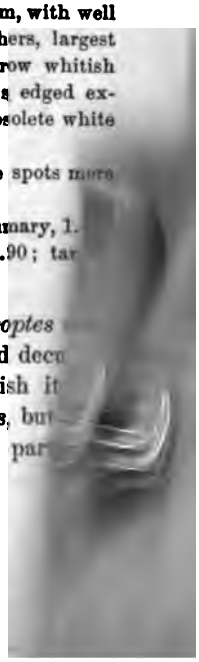
12,960. Bill as long as the head; all the lateral outlines gently decurved from the base. Bristles not very conspicuous, but reaching to the nostrils. Wings considerably shorter than the tail, much rounded. First primary broad, nearly half the length of the 2d; the 3d to the 7th quills nearly equal, their tips forming the outline of a gentle curve; the 2d quill shorter than the 9th. Tail considerably graduated, the lateral feathers more than an inch the shorter. Legs stout; tarsi longer than middle toe, distinctly scutellate, with seven scales.

Above ashy brown, with perhaps a tinge of rusty on the rump; beneath fulvous white, more fulvous on the flanks, inside of wing, and crissum. Beneath, except chin, throat, and from middle of abdomen to crissum, with well defined V-shaped spots of dark brown at the ends of the feathers, largest across the breast. Loral region hoary. Wings with two narrow whitish bands across the tips of greater and middle coverts; the quills edged externally with paler. Outer three tail feathers with a rather obsolete white patch in the end of inner web, and across the tips of the outer.

Spring specimens are of rather purer white beneath, with the spots more distinct than as described.

Length of 12,960 (skin), 10.00; wing, 4.10; tail, 4.65; 1st primary, 1. 2d, 2.50; bill from gape, 1.40, from above, 1.15, from nostril, .90; ta 1.26; middle toe and claw, 1.12; claw alone, .30.

This species is curiously similar in coloration to *Oreoscoptes tanus*, from which its much larger size, much longer and decu bill, and the graduated tail, of course readily distinguish it agrees in some respects with *H. rufus* and *longirostris*, bu smaller, the bill longer and more curved; the upper par ashy olivaceous brown instead of rufous, etc.



Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,511	1,090	♀	Cape St. Lucas.	1859.	J. Xantus.	.....
12,957	496	♂	"	...	"	.....
13,090	764	♂	"	...	"	.....
26,310	1,089	♂	"	Spring, '59.	"	.....

(12,957.) 10.50. Iris orange. (13,090.) 11.00. Iris orange.

Harporhynchus lecontei.

Toxostoma lecontei, LAWR. Ann. N. Y. Lyc. V, Sept. 1851, 109 (Fort Yuma).—*Harporhynchus lecontei*, BONAP. C. R. XXVIII, 1854, 57.—IB. Notes Delattre, 39.—BAIRD, Birds N. Am. 1858, 350, pl. l.

Hab. Gila River; Fort Yuma.

The specimen upon which the species was based by Mr. Lawrence, collected at Fort Yuma, by Dr. Leconte, still remains unique, and of *H. crissalis* a second specimen only has been obtained. It is not a little remarkable that two species so large and conspicuous should be both from the same region, and so very rare. With much the same shade of coloration, *H. crissalis* is a little darker, the under tail coverts deep chestnut instead of rusty fulvous; the bill is much longer and more slender, the tail also much longer.

No. 53. Fort Yuma. Cab. of Geo. N. Lawrence.

Harporhynchus crissalis.

Harporhynchus crissalis, HENRY, Pr. A. N. Sc. May, 1858.—BAIRD, Birds N. Am. 1858, 350, pl. lxxxii.

Hab. Region of the Gila River, to Rocky Mts.

A second specimen (11,533) of this rare species is larger than the type, but otherwise agrees with it. Its dimensions are as follows:—

Length before skinning, 12.50; of skin, 12.50; wing, 3.90; tail, 6.50; its graduation, 1.45; 1st quill, 1.50; 2d, .41; bill from forehead (chord of curve), 1.65, from gape, 1.75, from nostril, 1.30; curve of culmen, 1.62; height of bill at nostril, .22; tarsus, 1.30; middle toe and claw, 1.12.

The bill of this species, though not quite so long as in *redivivus*, when most developed, is almost as much curved, and much more slender—the depth at nostrils being but .22, instead of .26. The size of this specimen is equal to the largest of *redivivus* (3,932); the tail absolutely longer. The feet are, however, considerably smaller, the claws especially so; the tarsus measures but 1.30, instead of 1.52; the middle claw .29, instead of .36. With these differences in form, however, it would be impossible to separate the two generically.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
8,127	..	..	Mimbres.	...	Dr. T. C. Henry.	..... .
11,533	32	♂	Fort Yuma, Cal.	...	Lt. J. C. Ives.	H. B. Müllhausen.

8,127. Type; now in museum Phila. Acad. (11,533.) 12.50. Iris yellow.

Harporhynchus redivivus.

Harpes rediviva, GAMBEL, Pr. A. N. S. II, Aug. 1845, 264.—*Toxostoma rediviva*, GAMBEL, J. A. N. Sc. 2d ser. I, 1847, 42.—CASSIN, Illust. I, 1855, 260, pl. xlii.—*Harporhynchus redivivus*, CABANIS, Archiv Naturg. 1848, 98.—BAIRD, Birds N. Am. 1858, 349.—SCLATER, P. Z. S. 1859, 339.

This species has hitherto only been found in the coast region of California, whence numerous specimens have been received by the Smithsonian Institution.

MIMUS, BOIE.

Mimus, BOIE, Isis, Oct. 1826, 972. (Type *Turdus polyglottus*, LINN.)
Orpheus, SWAINSON, Zool. Jour. III, 1827, 167. (Same type.)

Bill not much more than half the length of the head; gently decurved from the base; notched at tip; commissure curved. Gonys straight, or slightly concave. Rictal bristles quite well developed. Wings rather shorter than the tail. First primary about equal to, or rather more than half the 2d; 3d, 4th, and 5th quills nearly equal, 6th scarcely shorter. Tail considerably graduated; the feathers stiff, rather narrow, especially the outer webs, lateral feathers about three-quarters of an inch the shorter in the type. Tarsi longer than middle toe and claw by rather less than an additional claw; tarsi conspicuously and strongly scutellate; broad plates seven.

Mimus polyglottus.

Turdus polyglottus, LINN. Syst. Nat. 10th ed. 1758, 169; 12th ed. 1766, 293.—*Mimus polyglottus*, BOIE, Isis, 1826, 972.—SCLATER, P. Z. S. 1856, 212.—IB. 1859, 340.—IB. Catal. 1861, 8, no. 51.—BAIRD, Birds N. Am. 1858, 344.

? *Orpheus leucopterus*, VIGORS, Zool. Beechey, 1839.

Figures: WILSON, Am. Orn. II, 1810, pl. x, fig. 1.—AUD. Orn. Biog. I, 1831, pl. xxi.—IB. Birds Amer. II, 1841, pl. 137.

Hab. North America, from about 40° (rare in Massachusetts, *Samuels*), south to Mexico. Said to occur in Cuba.

No. 12,511. The general proportions will best be illustrated by the table of measurements. The 3d and 4th quills are longest; the 2d equal to the 8th; the 1st more than half the 2d (in some specimens about half, in others half the 3d, as in No. 614.)

The upper parts are ashy, with a tinge of brown, the color purest on top of head. The lores are dusky. The under parts are white, purest on throat and middle of belly; a tinge of ashy across the breast, of yellowish-brown or faint fulvous on flanks and crissum. There are some obscure shaft streaks of brown on the flanks, mostly concealed under the wings. There is a slight indication of a dusky stripe on each side of the chin, caused by a range of short black bristles, the feathers themselves not appearing to be colored.

The wings and tail are dark brown, not black; the large feathers edged externally with ashy. There are two bands of white on the wing on the tips of the greater and middle coverts; the ends of the secondaries are also edged with white. In addition to this the basal portion of all the primaries is white, restricted to the extreme base in the outer ones, and encroaching successively in the rest until in the three innermost ones it occupies the basal two-thirds of the feather, or more, extending farthest forward on the inner web, the shafts remaining black. The small coverts overlying the bases of the primaries are also white, with a brown streak near the ends; this forms a conspicuous white patch on the outer surface of the wing.

The outer tail feather is white, slightly mottled in one or two places with brown, especially along the shaft near the end, and towards the base of the inner web. The next feather is white at the extreme base, and for about the terminal third of the inner web, and the end of the outer web. The third has a similar but much smaller patch of white along the middle of the inner web near the end; the fourth has no white. The bill and legs are black.

The markings of the wings are as described in most specimens, although in some the amount of white is less. There is, however, considerable difference in the white of the tail feathers. In a small proportion only of the whole number examined from eastern North America, is the outer feather pure white, and again sometimes the faint mottling on the inner web near the middle web becomes a conspicuous dusky patch. In several specimens the whole inner web of the second feather is white, with slight mottling along a portion of the inner edge (32,162). In 12,445 the white spot in the end of the 3d feather extends along the inner side of the shaft into a patch at the base. In this specimen the outer feather is entirely white; the whole inner web and the basal portion of the outer web of the second. In all the specimens before me the outer web of the second tail feather is black, except at the extreme base and tip. In none is there any white on the fourth feather.[1]

No. 12,511. Length, 9.00; wing, 4.10; tail, 4.90, its graduation, .70; 1st primary, 1.50; 2d primary, 2.70; bill from above, .63, from nostril, .50; tarsus, 1.25; middle toe and claw, 1.00; claw, .30.

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[1] Since writing the preceding description, I have met with one specimen (19,089, male, from Arkansas) which differs very considerably from any other I have seen in an unusual amount of white, which extends farther along the primaries so as to be very conspicuous. The two outer tail feathers are entirely white, except a slight edging at the end of the second; the third is white on the shaft and along the greater part of the inner web. The fourth has a small white patch on the end. The dimensions are: Length, 10.00; wing, 4.70; tail, 5.00.

I have not had an opportunity of examining the supposed *M. polyglottus* of Cuba. If, however, the description of *Orpheus polyglottus*, in De la Sagra's Cuba (Oiseaux, 53), be correctly drawn from a Cuban specimen, it may very readily be different, as the North American bird can certainly not be said to have the tail brown with a white spot towards the extremity of the lateral tail feathers, nor is there any white on the secondary quills. The rump cannot be called grayish-blue, in contrast with a pale grayish-brown of the remaining upper parts.

Mr. Richard Hill, in the Proceedings of the Philadelphia Academy, has suggested the idea that the name of *polyglottus* should be applied to the Jamaican rather than to the North American bird. The first citation of Linnæus is to Sloane's Jamaica, the second to Catesby, and the third to Kalm. As, however, the only locality given by Linnæus is "Virginia," and no mention is made of Jamaica; and as his next species is the Jamaican *orpheus*, it will perhaps be no violation of the most rigid rules of nomenclature to pass over the citation of Sloane as irrelevant, and confine the reference strictly to the continental species. The *Turdus orpheus*, of Linnæus, is based on the species of Brown and Edwards, both unmistakably the small Jamaican bird, and not the larger, *M. hillii*, as intimated by Mr. Hill.

In the "Birds of North America" I have adverted to the peculiarities of western specimens in having a longer tail than eastern. The tail is more graduated also, the lateral feathers being 1.25 inches or more shorter than the central. The whole bird, in fact, is larger; the wings being also longer, but the disproportionate length of the tail is quite decided.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,443	..	♂	Pennsylvania.	...	Nat. Institute.	Dr. G. Leib.
12,545	..	♂	Washington, D. C.	...	"	J. F. Callan.
19,089	57	♂	Fort Cobb.	May 24, '60.	J. H. Clark.	C. S. M'Carthy.
19,091	141	..	Adaline Creek	June 18, '60.	"	"
20,295	48	..	Fort Stockton, Tex.	May 26, '60.	P. Duffy.	.....
20,296	4	..	"	Mar. 12, '60.	"	.....
11,530	51	..	Big Cañon, Col. Riv.	...	Lt. J. C. Ives.	Mollhausen.
17,120	..	..	Cape St. Lucas.	1859.	John Xantus.	.....
17,445	3,317	♂	"	Oct. 31, '59.	"	.....
23,750	..	..	W. coast America.	...	Nat. Institute.	.....
23,913	28	..	El Mirador, Mex.	...	Dr. C. Sartorius.	.....
33,570	153	♀	"	Nov. 1863.	"	.....

19,089. Unusual amount of white on wings and tail.

Mimus orpheus.

Turdus orpheus, LINN. Syst. Nat. 10th ed. I, 1758, 169.—Ib. 12th ed. 1766.—VIEILLOT, Ois. Am. Sept. II, 1807, 12, pl. lxviii.—Gosse,

Birds Jam. 1846, 144.—*Mimus orpheus*, SCLATER, P. Z. S. 1859, 341. —IB. Catal. Am. Birds, 1861, 9, no. 52.—MARCH, Pr. A. N. Sc. 1863, 290 (eggs).

Mimus polyglottus, HILL, Pr. A. N. Sc. 1853, 304.

Turdus sp. 2, BROWNE, Nat. Hist. Jam. 1756, 469 (Jamaica).

Turdus cinereus minor, EDWARDS, Av. II, tab. lxxviii (Jamaica).—SELIGMANN, IV, pl. li.

? *Turdus dominicus*, LINN. Syst. Nat. 12th ed. I, 1766, 295 (based on *Merula dominicensis*, BRISSON, St. Domingo).

Hab. Jamaica; St. Domingo?

(No. 22,159.) In form, size, and coloration this species is exceedingly similar to *M. polyglottus;* the only marked difference in shape being an apparently more graduated tail than in the eastern specimens of the latter—the differences between the lateral and central feathers amounting to from one inch to one and a quarter. The differences in coloration between the two are much as if an additional tail feather entirely white had been provided for *M. orpheus*, the 2d, 3d, and 4th feathers being marked as the 1st, 2d, and 3d in *M. polyglottus*. There are the same variations in markings in the corresponding feathers of these two series in both species. The two outer feathers are usually entirely white; the 2d sometimes a little streaked; the 3d sometimes entirely white, always so on the inner web, generally partially so on the outer. The 4th has sometimes the whole inner web white; sometimes this is restricted to a patch towards its end. There is a very small spot of white on the end of the fifth feather.

The under parts are of a purer white than in *polyglottus*, and the ash of the breast is less distinct. The loral region also is conspicuously whiter. The two species can, however, at once be distinguished by the dusky outer web of the second tail feather in *polyglottus*, which is entirely white in *orpheus*.

Length, 9.90; wing, 4.35; tail, 5.20; bill from nostril, 1.00; tarsus, 1.25.

This species can hardly be considered as less in size than *polyglottus;* indeed, the measurements of the specimen selected for description are larger than those of the type of my description of the eastern variety of *polyglottus*. I have, in fact, not met with a skin so small as that described by Dr. Sclater.

I have never seen a specimen of *M. dominicus*, from St. Domingo, and can express no opinion as to its relationships to *M. orpheus*. It is described as having the outer three tail feathers white as in *orpheus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,156	..	..	Spanishtown, Jam.	...	W. T. March.	.....
22,157	..	♂	"	...	"	.....
22,158	..	..	"	...	"	.....
24,374	30	♂	"	Oct. 10, '61.	"	.....
24,375	30	♀	"	"	"	.....

Mimus bahamensis, BRYANT.

Mimus bahamensis, BRYANT, Pr. Bost. Soc. VII, Sept. 1859, 114.

Bill shorter than head. Rictal bristles reaching rather beyond the nostrils. Curvature of commissure gentle from base to near the notched tip, where it is increased. First primary large, rather falcate, just half the 2d; 4th quill longest; 3d and then 5th but little shorter; 2d intermediate between 7th and 8th, half an inch less than the longest. Tarsi distinctly scutellate; plates seven. Tail moderately graduated (.70).

Color above brownish-gray, each feather showing a brown centre, and grayish or ashy edges less distinct and more soiled on the lower part of the back. Beneath soiled grayish-white, the breast more gray, the feathers being ashy with lighter tips. The feathers of under parts with brown shaft-streaks, wanting on the throat and middle of the belly, partially concealed across the breast, more evident on the sides of belly, and broad and conspicuous under the wings, where the axillars are similarly streaked. Wing feathers brown, all margined with pale ashy; the greater and middle coverts with white, forming two bands. Tail feathers ashy above, suffused with brownish towards the borders, and edged with whitish. All have a whitish patch at end, on the inner web, and on the extreme tip of outer. This white is about half an inch long on the outer feather, a little less on the rest. Bill and legs black.

There is an obscure dusky line on each side of the throat; the ear coverts are dusky; the space between bill and eye is grayish-white. The whitish feathers of the cheeks are edged with dusky at the tips.

Length, 11.00; wing, 4.80; tail, 5.70; graduation, .70; 1st quill, 1.70; 2d, 3.28; bill above, 1.10; from nostril, .72; tarsus, 1.50; middle toe and claw, 1.34; claw, .35; hind toe and claw, .85; claw alone, .50.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,505	..	..	Bahama Key.	1859.	Dr. H. Bryant.	.....

13,505. Type.

Mimus hillii.

Mimus hillii, MARCH, Pr. A. N. Sc. Nov. 1863, 291 (Jamaica).
Mimus orpheus, HILL, Pr. A. N. Sc. 1863, 304.

(No. 24,376.) General form and characters as in *M. bahamensis*. Fifth quill longest; 4th and 6th a little shorter, then 3d; 2d shorter than 8th, about equal to the 9th, .65 shorter than the longest. Tail considerably graduated.

In some specimens the 3d quill is a little longer than the 8th; in all it is shorter than the 7th.

The colors are as described in *M. bahamensis*. The only appreciable difference is in the purer white of the under parts, and especially across the breast, where the feathers are of the same soiled white to their plumbeous bases, or for half the length, instead of being ashy to the scarcely appreciable lighter edges. There are no faint dusky shaft streaks on the feathers in front of the

jugulum, the shafts being white; on its sides alone are there indications of these, which on the sides of the breast and belly become more distinct than in *M. bahamensis*, owing to the purer white of the under parts. There is rather more white on the end of the tail feathers, this covering .70 in the outer one.

An immature specimen (26,802) is similar to the adults, but has a little more white on the end of the tail, and the feathers of the breast and jugulum show triangular spots of brown at the ends.

Length (of 24,376), 11.75; wing, 4.90; tail, 6.30; graduation, 1.00; 1st quill, 1.50; 2d quill, 3.00; bill from nostril, .70; tarsus, 1.51; middle toe and claw, 1.22; claw, .35.

This species is very closely related to the *M. bahamensis*, but appears to differ in some appreciable features. The distinction in coloration has already been adverted to. It is a larger species, and the tail is more graduated—the difference in length between the lateral and middle feathers being 1.00 instead of .70. The wings are more rounded; the 5th quill longest instead of the 4th; the 2d shorter than the 8th, instead of longer.

A larger series of specimens of *M. bahamensis* will perhaps be necessary fully to ascertain the relationships between the Bahaman and Jamaican birds, and prove whether they be really distinct or not. How they stand in reference to *M. gundlachi*, of Cuba, it is even more difficult to determine, as our only guide is the brief comparison by Cabanis of his species with *M. saturninus* of Brazil. To this, however, there is very little resemblance on the part of the Jamaican and Bahaman birds, as shown by comparing them with a specimen presented by the Berlin Museum. Cabanis speaks of the white tip of the tail feathers being but 3–4 lines long in *gundlachi;* in the others it is from one-half to three-quarters of an inch.

Of the South American *Mimi* in the museum of the Smithsonian Institution, the relationship is closest to *M. thenca*, of Chile, much more than to *saturninus*.

Mr. Hill thinks that this species is the *Turdus orpheus* of Linnæus. A careful examination, however, of the descriptions of Brown and Edwards, upon which the species was founded, will, I think, show conclusively that both authors had in view the small Mocking bird of Jamaica, rather than the large one.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
24,376	29	♂	Port Henderson,	Nov. 29, '61.	W. T. March.	.....
24,377	29	♀	" [Jam.	"	"	.....
26,804	29	♂	"	Oct. 1862.	"	.....
26,802	29	Juv. ♀	G. Salt Pond, Jam.	Nov. 1, '62.	"	.....
26,803	..	♂	"	Oct. 31, '62.	"	.....

Mimus gracilis.

Mimus gracilis, CABANIS, Mus. Hein. 1850, 83 (Honduras).—SCLATER & SALVIN, Ibis, 1859, 5.—SCLATER, P. Z. S. 1859, 343.—IB. Catal. 1861, 9, no. 58.—CAB. Jour. 1860, 410 (Costa Rica).—TAYLOR, Ibis, 1860, 110 (Comayagua).

Hab. Honduras, Guatemala; Costa Rica.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,651	43	..	San Geronimo, Guat.	Dec. 1859.	O. Salvin.	.....

GALEOSCOPTES, CABANIS.

Galeoscoptes, CABANIS, Mus. Hein. I, 1850, 82. (Type *Muscicapa carolinensis*, L.)

Bill shorter than the head, rather broad at base. Rictal bristles moderately developed, reaching to the nostrils. Wings a little shorter than the tail, rounded; secondaries well developed; 4th and 5th quills longest; 3d and 6th little shorter; 1st and 9th about equal, and about the length of secondaries; 1st quill more than half the second, about half the 3d. Tail graduated; lateral feather about .70 shorter than the middle. Tarsi longer than middle toe and claw by about an additional half claw; scutellate anteriorly, more or less distinctly in different specimens; scutellæ about seven.

The conspicuous naked membranous border round the eye of some Thrushes, with the bare space behind it, not appreciable.

I find little difference in form between the single species of *Galeoscoptes* and *Mimus polyglottus*, beyond the less degree of definition of the tarsal plates; and but for the difference in coloration (uniform plumbeous instead of gray above and white beneath), would hardly be inclined to distinguish the two generically.

Galeoscoptes carolinensis.

Muscicapa carolinensis, LINN. Syst. Nat. I, 1766, 328.—*Turdus carolinensis*, LICHT. Verz. 1823, 38.—D'ORBIGNY, La Sagra's Cuba Ois. 1840, 51.—*Mimus carolinensis*, GRAY, BAIRD, Birds N. Am. 1859, 346.—*Galeoscoptes carolinensis*, Cab. Mus. Hein. I, 1850, 82 (type of genus).—IB. Jour. Orn. 1855, 470 (Cuba).—SCLATER, Catal. Birds, 1861, 6, no. 39.

Figures: AUD. B. A. II, pl. 140.—IB. Orn. Biog. II, pl. 28.—VIEILLOT, Ois. Am. Sept. II, pl. lxvii.—WILSON, Am. Orn. II, pl. xiv, f. 3.

Hab. United States, north to Lake Winnipeg, west to head of Columbia, south to Panama R. R.; Cuba.

In some specimens there is a tendency to obsolete narrow transverse bars at the ends of the outer tail feathers. The shade of colora-

tion varies somewhat. Rocky Mountain specimens appear a little larger than others. The smallest is 29,222, from Orizaba; in this the wing measures 3.40, the tail 3.80. A female, 10,352, from Florida, is also very small. There is considerable difference in the length and thickness of the bill in different specimens. In some specimens the tarsal scutellæ are perfectly well defined, in others indistinct on the sides of the tarsus.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,123	..	♂	Carlisle, Pa.	July 15, '43.	S. F. Baird.	S. F. Baird.
10,352	..	♀	Indian Key, Fla.	Jan. 12.	G. Wurdemann.	.....
11,888	..	♀	Tortugas, Fla.	...	Capt. Woodbury.	.....
13,137	6	♂	Fort Garry, Red Riv.	...	C. A. Hubbard.	.....
18,506	32	..	"	July 10.	Donald Gunn.	.....
13,306	..	..	Leavenworth, Mo.	May 16.	Capt. J. H. Simp-	.....
5,285	..	♂	Ft. Lookout, Mo. Riv.	June 4, '56.	Lt. Warren. [son.	Dr. Hayden.
22,045	120	..	Cœur d'Alene Mis'n.	...	Dr. J. G. Cooper.	.....
21,960	481	♂	Sinyakwateen Depot, W. T.	June 27, '60.	A. Campbell.	Dr. Kennerly.
21,961	566	♂	Camp on Kootenay R.	July 28, '60.	"	"
21,962	567	..	"	"	"	"
33,170	11	..	Nassau, N. P.	April 22, '64.	Lt. Fitzgerald.	.....
29,631	..	..	Cuba.	...	C. Wright.	.....
30,868	76	..	El Mirador, Mex.	...	Dr. C. Sartorius.	.....
29,222	300	..	Orizaba, Mex. [jole.	...	Prof. Sumichrast.	.....
16,838	..	..	Panama R. R. Fri-	...	J. M'Leannan.	.....
..	15	..	Guatemala.	...	Cab. Lawrence.	.....

(1,123.) 9; 11.50; 3.50. (10,352.) 8.25. (11,888.) 8.50. (13,137.) With eggs, 2,258. (5,285.) Eyes brown.

MELANOPTILA, Sclater.

Melanoptila, Sclater, P. Z. S. 1857, 275. (Type *M. glabrirostris*.)

As there is but a single known species of this genus, I give the generic characters with the specific.

Melanoptila glabrirostris.

Melanoptila glabrirostris, Sclater, P. Z. S. 1857, 275 (Omoa, Honduras, with figure of head and wing).—Ib. 1859, 337.—Ib. Catal. Am. Birds, 1861, 7, no. 41.—Sclater & Salvin, Ibis, I, 1859, 7.

Hab. Honduras.

Bill shorter than the head; quite similar in shape to that of *Mimus carolinensis*, but apparently without any trace of rictal bristles (the specimen before me has the tip broken so that I am unable to speak as to the notch).

Tarsi rather longer than the middle toe and claw, scutellate on the anterior half, though not very distinctly; claws rather weak.

Wings broad, much rounded, a little shorter than the tail; secondaries elongated, longer than the 2d quill; 5th and 6th quills longest, forming the middle of a gentle curve with the 3d and 4th on one side; the 7th and 8th on the other; 2d quill shorter than the 9th, and rather less than secondaries;

1st quill rather more than half the 2d. Tail rather broad, graduated; the lateral feather .60 shorter than the central; the feathers rather soft and broader than usual on the outer webs.

Color glossy black; wings and tail with a greenish lustre; rest of body glossed with steel blue. Bill and legs black.

Length, 7.60; wing, 3.55; tail, 3.90; gape, .87; tarsus, 1.05; middle toe and claw, .92.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,652	33	..	Half Moon Key, Br. Honduras.	May 10, '62.	O. Salvin.	Salvin & Godman.

MELANOTIS, Bonap.

Melanotis, Bonap. Conspectus, I, 1850, 276. (Type *Orpheus cærulescens*, Sw.)

Bill elongated, rather slender, compressed, as long as the head. Commissure nearly straight to the decurved, notched tip. Rictal feathers moderate, reaching to the nostrils.

Wings decidedly shorter than the tail; 4th and 5th quills longest; 6th and 7th a little shorter than the 3d; 2d shorter than the secondaries; nearly as much shorter than the 4th as it is longer than the 1st; 1st quill two-thirds the 2d, half as long as the longest. Tail long, broad, and graduated; the feathers soft, with outer webs unusually broad, as in *Melanoptila;* lateral feathers 1.25 less than the central.

Legs rather weak, but the tarsus longer than middle toe; distinctly scutellate on anterior half, with seven broad scutellæ. Claws strong, and well curved.

The type of the genus is the *Orpheus cærulescens* of Swainson. The second assigned species, *M. hypoleucus*, differs somewhat in form. The bill is shorter and less attenuated; the wing apparently shorter and more concave; the legs and the claws are stouter, and the tarsus is but little longer than the middle toe and claw. Both species are slaty blue, with the side of the head black. In *cærulescens* the blue extends over the inferior surface, which in *hypoleucus* is white with the exception of the blue crissum.

Melanotis cærulescens.

Orpheus cærulescens, Swainson, Phil. Mag. 1827, 369 (Mexico).—*Mimus cærulescens*, Sclater, P. Z. S. 1856, 294.—*Melanotis cærulescens*, Bonap. Consp. 1850, 276.—Sclater, P. Z. S. 1859, 337 (Cordova, 370; Oaxaca).—Ib. Catal. 1861, 7, no. 42.

? *Turdus erythrophthalmus*, Licht. Preis-Verzeich. 1830, no. 83.

Turdus melanotis, Temm. Pl. Col. 498.

Hab. Mexico generally.

Measurement (26,374). Length, 10.75; wing, 4.80; tail, 5.40; bill from gape, 1.35; nostril, .70; tarsus, 1.18; middle toe and claw, 1.10; claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
26,374	..	..	Xalapa.	...	John Krider.	D'Oca.
29,554	4,282	..	Mexico.	...	Berlin Museum.	.....
29,719	..	..	"	...	De Saussure.	.....
28,031	35	..	Mirador, Mex.	...	Dr. C. Sartorius.	.....
29,355	99	♂	Colima, Mex.	Jan. 1863.	J. Xantus.	.....
30,135	151	♂	"	Feb. 1863.	"	.....
34,013	183	♀	Mazatlan.	June, 1862.	A. J. Grayson.	.....
34,014	184	♂	"	"	"	.....
..	17	..	Xalapa.	...	Cab. Lawrence.	D'Oca.

(29,355.) Length, 10. Iris brown. (30,135.) Length, 10.50. Iris brown.

Melanotis hypoleucus.

Melanotis hypoleucus, HARTLAUB, R. Z. Oct. 1852, 460.—IB. Jour. f. Ornith. 1853, 30.—SCLATER & SALVIN, Ibis, I, 1859, 7 (eggs).—IB. II, 1860, 29.—SCLATER, P. Z. S. 1859, 337.—IB. Catal. 1861, 7, no. 43.

Hab. Guatemala.

Total length, 10.00; wing, 4.00; tail, 4.90; difference of tail feathers, 1.25; exposed portion of 1st primary, 1.50; of 2d, 2.40; length of bill from forehead, 1.15, from nostril, .68; along gape, 1.32; tarsus, 1.26; middle toe and claw, 1.10; claw alone, .30; hind toe and claw, .75; claw alone, .37.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,395	373	..	Coban, Vera Paz.	...	O. Salvin.	.....
16,843	..	..	Guatemala.	...	J. Gould.	.....
..	18	..	"	...	Cab. Lawrence.	.....

DONACOBIUS, SWAINSON.

Donacobius, SWAINSON, Class. Birds, II, 1831, 236. (Type *D. vociferans*, Sw. = *Turdus atricapillus*, L.)

Bill as long as head, notched. Bristles distinct, reaching to nostrils. Nasal groove broad, filled by a plane, tense, naked, thin edged membrane; the nostrils pervious, occupying the anterior extremity of the groove, bordered behind only by membrane; broadly oval, the axis rather oblique. A large, bare naked space on each side the neck. Wings shorter than the much graduated tail. First primary about half the longest (fifth); 2d shorter than the secondaries. Tail feathers broad; outer webs of lateral feathers having their outer webs half as wide as the inner. Graduation excessive; outer feather about half the middle.

Tarsi little longer than middle toe and claw, with six scutellæ anteriorly fused into a continuous ungrooved plate on the outer side. Claws lengthened, moderately curved. Inner toe cleft to base.

Total length, 8.00; wing, 3.30; tail, 4.20; graduation, 2.00; exposed portion of 1st primary, 1.27, of 2d, 1.90, of longest (measured from exposed base of 1st primary), 2.45; length of bill from forehead, 1.05, from nostril, .63; along gape, 1.26; tarsus, 1.32; middle toe and claw, 1.10; claw alone, .37; hind toe and claw, .90; claw alone, .42.

The genus *Donacobius* has been variously placed by authors, by some among the Thrushes, by others among the Wrens. The notched bill, the bristled rictus, and above all the deeply parted toes, with the general coloration, appear however decidedly opposed to the latter view of its affinities; and I have accordingly inserted it here. It is a very strongly marked genus, and the only one of the family without any representatives in Northern or Middle America.[1]

Having thus enumerated the species of *Turdidæ* from the region embraced in the present work, which I have had the opportunity of examining in the museum of the Smithsonian Institution, or elsewhere, I proceed to mention the remaining species which have been given by other authors. The names used are generally those of Dr. Sclater's Catalogue of American Birds, where the precise synonymy will be found:—

Turdus pinicola, Sclater, Catal. 1861, 6, no. 36. Xalapa.
plebeius, Cabanis, Jour. 1860, 323. Costa Rica.
nigrescens, Cab. Jour. 1860, 325. Costa Rica.

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[1] Most authors admit of but one species in the genus *Donacobius*, placing the Bolivian *D. albo-vittatus*, of D'Orbigny, as a synonym of *D. atricapillus*. Specimens in the Smithsonian collection, however, seem to indicate a decided difference in the much larger size of the Bolivian bird (length, 9.00; wing, 3.50; tail, 4.50—instead of 8.25; 3.20; 4.00). There is also a very conspicuous and distinct white stripe from the upper edge of the eye along the side of the head to the nape. This stripe is only faintly indicated, generally not at all in the *atricapillus*. The synonomy will be as follows:—

1. Donacobius atricapillus. *Hab.* Eastern South America.

Turdus atricapillus, Linn. S. N. I, 295.—*Donacobius atricapillus*, Bon. Consp. 277.—Burmeister, Th. Bras. Aves, II, 129.
Turdus and *Donacobius brasiliensis, vociferans*, etc.
Fig.: Swainson, Zool. Ill. n. s. pl. xxvii.

Specimens from Brazil.

2. Donacobius albo-vittatus. *Hab.* Bolivia.

Donacobius albo-vittatus, D'Orb. Mag. de Zool. 1837, 19.
Donacobius albo-lineatus, D'Orb. Voyage, IX, Atlas Zoologique, 1847, pl. xii.—Bon. Notes Delattre, 1854,'40.

Specimens Nos. 16,832, 16,833. Bolivia, *W. Evans.*

Margarops densirostris (VIEILL.), SCLATER, P. Z. S. 1859, 336. Guadaloupe and Martinique.

montanus (LAFR.), SCL. P. Z. S. 1859, 336. Guadaloupe.

Cichlerminia bonapartii (LAFR.), SCLATER, P. Z. S. 1859, 335. Guadaloupe.

Cinclocerthia ruficauda (GOULD), SCLATER, Catal. 1861, 7, no. 45. Guadaloupe.

gutturalis, SCLATER, P. Z. S. 1859, 358. Martinique.

Mimus dominicus, SCLATER, P. Z. S. 1859, 341. St. Domingo.

gundlachi (CAB.), SCLATER, P. Z. S. 1859, 342. Cuba.

Harporhynchus ocellatus, SCLATER, Catal. 1862, 358, no. 49. Oaxaca, Mex.

The following species are mentioned as occurring in Tobago and Trinidad. All of them are in the collection of the Institution from South America:—

Turdus phæopygus, SCLATER, Catal, 1861, 3. Tobago; Venezuela, etc.

gymnophthalmus (CAB.), SCL. Catal. 1861, 4. Tobago; Venezuela, etc.

xanthoscelis, JARDINE, SCL. Catal. 1861, 5. Tobago (Bogota, *Verreaux*).

Mimus melanopterus, LAWR. SCL. Catal. 1861, 9. Trinidad; Venezuela.

FAMILY CINCLIDÆ.

CINCLUS, BECHST.

Cinclus, BECHST. "Gemein. Naturg. 1802." (Type *Sturnus cinclus*, L.)
Hydrobata, VIEILL. Analyse, 1816.—BAIRD, Birds N. Am. 1858, 229.[1]

There are three well marked species of this genus in America: one entirely dusky (*C. mexicanus*); one dusky, with white head

[1] After a careful consideration of the subject I have come to the conclusion that as followers of the Linnæan *binomial* system of nomenclature, we are not authorized to adopt any genus which is not based by its author upon some particular object having a specific name avowedly used in the Linnæan binomial sense. For this reason I begin my reference to the genera of Linnæus with the 10th edition (1758) of the Systema Naturæ (the first in which the binomial system is presented); not adopting a name from an earlier edition of the same author, where it would conflict with the one mentioned. This is substantially the rule of the British Association, which, however, selects the

and throat, from Bolivia (*C. leucocephalus*, Tschudi); and one dusky, with white head, back, and under parts, from Ecuador and New Grenada (*C. leuconotus*, Scl.). Of these, specimens of *leucocephalus* are in the Smithsonian collection, from Bolivia; and Mr. Lawrence possesses *C. leuconotus*, from Ecuador.

Cinclus mexicanus.

Cinclus pallasii, Bon. Zool. Jour. II, 1827, 52 (not the Asiatic species).
Cinclus mexicanus, Sw. Phil. Mag. 1827, 368.—Sclater, Catal. 1861, 10.—*Hydrobata mexicana*, Baird, Birds N. Am. 1858, 229.—Cooper & Suckley, Rep. P. R. R. XII, II, 1859, 175 (nest).
Cinclus americanus, Rich. F. B. A. II, 1831, 273.
Cinclus unicolor, Bon.; *C. mortoni*, Towns.; *C. townsendii*, "Aud." Towns.
Figures: Bonaparte, Am. Orn. II, 1828, pl. xvi, fig. 1.—Aud. Orn. Biog. pl. 370, 435.—Ia. Birds Amer. II, pl. 137.

Hab. Found through the mountainous region of the central part of North America, from Fort Halkett south into Mexico. None received from the coast region of California.

A Mexican specimen, from Xalapa, representing the species as established by Swainson, is rather darker below than skins from the United States, and the feathers exhibit none of those whitish edgings so common (but not universal) in the latter. The smoky brown of the head and neck is sharply defined against the plumbeous of the back, but below shades off insensibly in a wash over the breast. The bill is black; the legs dark brown.

In a young bird from Chiloweyuck Depot, the chin and throat are of a dirty white, and the head is plumbeous without any of the smoky brown tinge.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
31,119	900	..	Fort Halkett, B. A.	Dec. 10, '62	J. Lockhart.	Mr. Brass.
31,120	901	..	"	"	"	"
11,419	..	..	Frazer's Riv. B. Col.	Mar. 1858.	A. Campbell.	Dr. Kennerly.
11,905	215	..	Chiloweyuck.	...	"	"
19,197	227	..	Deer Creek, Neb.	Jan. 4, '60.	Capt. Raynolds.	Dr. Hayden.
11,467	..	..	Fort Mass. N. M.	...	Capt. Bowman.	.....

12th edition as the starting point, instead of the 10th, though without any apparent good reason.

As Mœhring is not a Linnæan binomialist, only adopting the generic or uninomial idea, and not the binomial, I do not consider his names as tenable, and consequently do not find that his use of the name *Cinclus*, in 1752, for another genus, is a pre-occupation, as rigidly understood.

FAMILY SAXICOLIDÆ.

SAXICOLA, BECHST.

Saxicola, BECHSTEIN, "Gemein. Naturg. 1802." (Type *Motacilla œnanthe*, L.)

Saxicola œnanthe.

Motacilla œnanthe, LINN. Syst. Nat. I, 1758, 186.—*Saxicola œnanthe*, BECHST. "Gemein. Naturg. 1802," and of European authors.—HOLBÖLL, Orn. Grœn. (Paulsen ed.), 1846, 23 (Greenland).—BAIRD, Birds N. Am. 1858, 220 (Europe).—JONES, Nat. Bermuda, 1859, 28 (Bermuda).—COUES, Pr. A. N. S. 1861, 218 (Labrador).—REINHARDT, Ibis, 1861, 5 (Greenland).

?*Saxicola œnanthoides*, VIGORS, Zool. Blossom, 1839, 19 (N. W. America).—CASSIN, Ill. I, 1854, 208, pl. xxxiv (Nova Scotia).

Hab. A European bird abundant in Greenland, found as an autumnal migrant in Labrador, Canada, Nova Scotia, Bermuda, etc. Occurs also in Behring Straits. I have not seen any from the United States.

This species of late years has been frequently detected in the eastern portions of North America, and may be legitimately considered as belonging to our Fauna. The specimens collected all appear to belong to the Greenland race (see Coues as above), which is considerably larger than that of central Europe, and it is most probable that they have reached North America by the Greenland route. I have never seen a full plumaged spring specimen, all being in autumnal livery, and it is not at all improbable that those hitherto detected in America are merely winter visitors from Greenland (where it is abundant), and to which they return to breed. The bird may, however, nest in Newfoundland and Labrador.

The specimen described by Vigors, from the N. W. coast of America, is considerably smaller even than skins from central Europe, and may be distinct, as suggested by Mr. Coues.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,075	206	♂	Grosvater Bay, Lab.	Aug. 24, '60.	Elliot Coues.	.....
..	..	..	Quebec. [land.	...	W. Couper.	.....
20,551	43	..	Godthaab, Green-	...	Williams Coll. Lyc.	.....

(18,075.) 7.00; 12.60; 4.30.

SIALIA, Swainson.

Sialia, Swainson, Zool. Jour. III, Sept. 1827, 173. (Type *Motacilla sialis*, Linn.)

Sialia sialis.

Motacilla sialis, Linn. S. N. 1758, 187 (based on Catesby, I, pl. 47).—*Sialia sialis*, Baird, Birds N. Am. 1858, 222.—Boardman, Pr. Bost. Soc. 1862, 124 (Calais, Me.; very rare).

Sialia wilsonii, Swainson, Zool. Jour. III, 1827, 173.—Cab. Jour. 1858, 120.—Gundlach, Cab. Jour. 1861, 324.—Jones, Nat. Bermuda, 1859, 28, 66 (resident in Bermuda).

Sylvia sialis, Lath.; *Ampelis sialis*, Nutt.; *Erythraca wilsonii*, Sw.

Figures: Vieillot, Ois. Am. Sept. II, pl. ci, cii, ciii.—Wils. I, pl. iii.—Aud. Orn. Biog. II, pl. cxiii.—Ib. B. A. II, pl. 134.—Docherty, Cab. I, pl. xii.

Hab. Eastern United States; resident in Bermuda; Cuba (rare), *Gundlach*.

As far as the indications of the large number of specimens in the Smithsonian Museum extend, this species is confined to the eastern faunal region of the United States and the Provinces, not extending up the western tributaries of the Missouri into the region of the sterile plains, nor northward beyond Lake Winnipeg. It is a rare bird in the West Indies—Gundlach recording it as scarce in Cuba. It is resident in Bermuda, whence the eggs have been received by the Institution.

From the fact of the rarity of this species as a winter migrant in the West Indies, and its not occurring at all on the western plains, I am inclined to believe that the difference in shade of color shows the Mexican and the Guatemalan species to be distinct from the North American, and entitle it to a specific appellation.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,015	..	..	Selkirk Settlement.	...	Donald Gunn.	.....
8,882	23	♂	Loup Fork of Platte.	July 3.	Lt. Warren.	Dr. Hayden.
13,163	..	♂	St. Joseph's, Mo.	...	Lt. Mullan.	J. Pearsall.
6,560	..	..	Fort Riley, Kansas.	...	Dr. W. A. Hamond.	.....
1,286	..	..	Carlisle, Pa.	Mar. 9, '44.	S. F. Baird.	.....
3,865	..	..	Prairie Mer Rouge L.	...	Jas. Fairie.	.....

Sialia azurea.

Sialia azurea, Swainson, Phil. Mag. I, 1827, 369.

Sialia wilsonii, Sclater, P. Z. S. 1856, 293 (Cordova).—Ib. 1858, 299 (Oaxaca—high lands).—Ib. 1859, 362 (Xalapa).—Sclater, Ibis, 1859, 8 (Guatemala).—Ib. Catal. 1861, 11, no. 65.—Taylor, Ibis, 1860, 110 (Honduras).—Owen, Ibis, 1861, 60 (Guatemala), nest.

Hab. Eastern Mexico and Guatemala.

(28,021.) Similar to *S. sialis*, but differing in shade of blue, which is greenish, not purplish. Whole upper parts, with sides of head and lower jaw, greenish-blue; beneath brownish-red, except abdomen to crissum, which are white. Female with the plumage duller, the outer web of second primary abruptly edged with white.

Total length, 6.70; wing, 4.00; tail, 3.20; bill from nostril, .35; along gape, .80; tarsus, .80; middle toe and claw, .84.

I was not a little surprised, on comparing a series of four Mexican and Guatemalan Blue Birds with about fifty from the United States, to find certain uniform differences in coloration and form, warranting the specific separation that Swainson hints at in the reference cited above. The shade of blue is appreciably different: instead of being of the rich dark purplish pure blue of *S. sialis*, it is of almost the very shade of greenish-blue seen in *S. arctica*, without the purplish lustre of the latter. The abrupt white margin of the outer primary in female (?) specimens I have not noticed in the North American bird. Of about the same length of body and wing, the tail is decidedly longer, measuring in the type specimen 3.20, instead of 2.75 or 2.80, the usual length in *S. sialis*.

Although Swainson did not describe this species in such manner as to entitle him to it, I have preferred to adopt his name rather than present a new one.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
28,021	11	..	Mirador, Mex.	...	Dr. C. Sartorius.	.....
28,022	11	..	"	...	"	.....
28,023	11	..	"	...	"	.....
30,661	..	..	Tactic, Vera Paz, [Guat.	Nov. 5, '59.	O. Salvin.	.....

Sialia mexicana.

Sialia mexicana, Sw. F. B. Am. II, 1831, 202.—Sclater, P. Z. S. 1856, 293 (Cordova); 1857, 126 (California); 1859, 362 (Xalapa).—Ib. Catal. 1861, 11, no. 66.—Baird, Birds N. Am. 1858, 223.—Cooper & Suckley, P. R. R. XII, II, 1859, 173.

Sialia occidentalis, Towns., Aud.; *Sialia cæruleocollis*, Vigors.

Figures: Aud. B. A. II, pl. 135.—Ib. Orn. Biog. V, pl. 393.—Vigors, Zool. Beechy Voy. 1839, pl. iii.

Hab. Western United States, from the Rocky Mountains to Pacific. Not noticed on the Missouri plains, British America, or Cape St. Lucas. Found at Xalapa and Cordova, Mex. (Sclater).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,617	265	..	Fort Steilacoom.	Mar. 1856.	Dr. Suckley.	.....
1,930	..	♂	Columbia Riv.	...	S. F. Baird.	J. K. Townsend.
4,903	..	♀	San Diego, Cal.	...	Lt. Parke.	Dr. Heermann.
7,633	..	..	Gila River.	Dec. 30, '54.	Major Emory.	A. Schott.
13,315	766	♂	Hellgate, Idaho.	1860.	Lt. Mullan.	J. Pearsall.
13,282	..	♂	Sweet Water.	Aug. 19, '58.	Capt. J. H. Simpson.	C. S. M'Carthy.
5,051	..	..	Fort Fillmore, N. M.	...	Capt. Pope.	.....
4,020	..	..	Saltillo, Mex.	May, 1853.	Lt. Couch.	.....

Sialia arctica.

Erythraca (*Sialia*) *arctica*, SWAINS. F. B. A. II, 1831, 209, pl. 39.—*Sialia arctica*, NUTTALL, Man. II, 1832, 573.—BAIRD, Birds N. Am. 1858, 224.—SCLATER, Catal. 1861, 11, no. 67.

Sialia macroptera, BAIRD, Stansbury's Rept. 1852, 314 (larger race with longer wings).

Hab. Central table lands of North America, east to mouth of Yellowstone. One individual collected at Fort Franklin, Great Bear Lake. Not common on the Pacific slope; the only specimens received coming from Simiahmoo, Fort Crook, and San Diego. Not recorded as found in Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,875	..	♂	Fort Union, Neb.	July 1, '43.	S. F. Baird.	J. J. Audubon.
3,706	..	♂	Salt Lake City.	Mar. 21, '51.	Capt. Stansbury.	.....
21,918	487	..	Kootenay Riv. W.T.	...	A. Campbell.	Dr. Kennerly.
27,428	..	..	Simiahmoo, W. T.	...	"	"
17,999	406	..	Fort Crook, Cal.	...	John Feilner.	.....
28,131	207	♂	"	Mar. 10, '62.	D. F. Parkinson.	.....
4,425	..	..	San Diego, Cal.	April, 1855.	Lt. Trowbridge.	.....

(3,706.) Type of *S. macroptera*.

FAMILY SYLVIIDÆ.

Bill slender, broad and depressed at the base, distinctly notched and decurved at the tip. Culmen sharp-ridged at base. Frontal feathers reaching to the nostrils, which are oval, with membrane above, and overhung—not concealed—by a few bristles or by a feather. Rictal bristles extending beyond nostrils. Tarsi booted or scutellate. Basal joint of middle toe attached its whole length externally, half-way internally. Primaries ten: spurious primary about half the 2d, which is shorter than the 7th. Lateral toes equal.

The birds of this family are readily distinguished from the *Paridæ*, by the slender bill, notched and decurved at tip; much bristled gape, sharp-ridged culmen, exposed oval nostrils, less adherent toes,

etc. They are much smaller than the *Turdidæ* and *Saxicolidæ*, with much more slender, depressed bill, longer rictal bristles, etc. The short outer primary, with the primaries ten in number, distinguish them from the *Sylvicolidæ*.

Of the two subfamilies, *Regulinæ* are more nearly related to the *Saxicolidæ*, and *Polioptilinæ* to the *Paridæ;* and have, by many authors, been respectively thus assigned. I agree with Cabanis, however, in uniting them into one family. They may thus be distinguished:—

Regulinæ. Wings longer than the emarginate tail. Tarsi booted or without scutellar divisions.

Polioptilinæ. Wings about equal to the graduated tail. Tarsi with distinct scutellæ.

REGULUS, Cuv.

Regulus, Cuv. "Leçons d'Anat. Comp. 1799–1800." (Type *Motacilla regulus*, Linn.)

Reguloides, Blyth. 1847. (Type "*R. proregulus*, Pall.," Gray.)

Phyllobasileus, Cab. Mus. Hein. I, 1850, 33. (Type *Motacilla calendula*, Linn.)

Regulus satrapa.

Regulus satrapa, Licht. Verz. 1823, no. 410.—Baird, Birds N. Am. 1859, 227.—Sclater, P. Z. S. 1857, 212 (Orizaba).—Bædeker, Cab. Jour. IV, 33, pl. 1, fig. 8 (eggs, from Labrador).—Pr. Max. Cab. Jour. 1858, 111.—Cooper & Suckley, P. R. R. R. XII, II, 1859, 174 (winters in W. Territory).

Sylvia regulus, Wils.; *Regulus cristatus*, Vieill.; *R. tricolor*, Nutt., Aud.

Figures: Aud. B. A. II, pl. 132.—Ib. Orn. Biog. II, pl. 183.—Vieill. Ois. Am. Sept. II, pl. cvi.

Hab. United States and the Eastern Provinces.

This species is found throughout the entire region of the United States and the Provinces, though hitherto not noticed in the fur countries. On the Pacific slope it is abundant from the Puget Sound country (where it is found in winter), south to Fort Crook; but no specimens are in the collection from more southern points, not even Fort Tejon, nor any from the middle table land or Rocky Mountain region anywhere.

The western specimens are much brighter and more olivaceous above, especially on rump and tail, than the eastern, and may possibly constitute a different race, or variety *olivaceus*. Sclater records it as found at Orizaba, Mex. This may, however, prove to be a different species.

Young birds, as with *R. calendula*, are without the colored crown.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,237	..	..	Sherborn, Mass.	...	O. S. Babcock.	.....
828	..	♂	Carlisle, Pa.	Oct. 22, '42.	S. F. Baird.	.....
32,224	..	♂	Liberty Co., Ga.	...	Prof. Leconte.	.....
11,861	200	♀	Simiahmoo, W. T.	Nov. 23.	A. Campbell.	Dr. Kennerly.
7,176	130	Juv.	Steilacoom.	...	Dr. Suckley.	.....
16,161	244	♂	Fort Crook, Cal.	...	Capt. J. Pellner.	.....

Regulus cuvieri.

Regulus cuvieri, Aud. Orn. Biog. I, 1832, 288, pl. 55, etc.—Baird, Birds N. Am. 1859, 228.

Hab. "Banks of Schuylkill River, Penn. June, 1812." *Aud.*

This species continues to be unknown, except from the description of Mr. Audubon, as quoted above.

Regulus calendula.

Motacilla calendula, Linn. Syst. Nat. I, 1766, 337.—*Regulus calendula*, Licht. Verz. 1823, no. 408.—Baird, Birds N. Amer. 1858, 226.—Sclater, P. Z. S. 1857, 202.—Ib. 1858, 300 (mountains of Oaxaca).—Ib. 1859, 362 (Xalapa).—Ib. Ibis, I, 1859, 8 (Guatemala).—Cooper & Suckley, P. R. R. XII, II, 1859, 174.—Reinhardt, Ibis, 1861, 5 (Greenland).

Regulus rubineus, Vieill. Ois. Am. Sept. II, 1807, 49, pl. civ, cv.

Other figures: Wils. Am. Orn. I, 1808, pl. v, fig. 3.—Doughty, Cab. II, pl. vi.—Aud. Orn. Biog. II, pl. 195.—Ib. Birds Am. II, pl. 133.

Hab. Greenland; whole of North America, and south to Guatemala.

This species of *Regulus* appears to lack the small feather which, in *satrapa*, overlies and conceals the nostrils, which was probably the reason with Cabanis & Blyth for placing it in a different genus. There is no other very apparent difference of form, however, although this furnishes a good character for distinguishing between young specimens of the two species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,083	167	♀	Grosvater Bay, Lab.	Aug. 6, '60.	Elliot Coues.	.....
20,021	486	♂	Fort George, H. B.	July 11, '60.	C. Drexler.	.....
19,482	459	♂	Fort Resolution.	May 17.	R. Kennicott.	.....
27,232	1,339	..	"	...	B. R. Ross.	.....
1,343	..	♂	Carlisle, Pa.	April 10, '44.	S. F. Baird.	.....
32,232	..	♂	Liberty County, Ga.	Mar. 1848.	Prof. Leconte.	.....
14,620	295	♀	Simiahmoo Bay.	April 23, '59.	A. Campbell.	Dr. Kennerly.
..	..	..	Fort Tejon, Cal.	...	J. Xantus.	.....
4,564	..	..	San Diego, Cal.	...	Lt. Trowbridge.	.....
7,172	..	..	Zapia, Mex.	...	Major Emory.	Dr. Kennerly.
18,631	..	..	Guatemala.	...	J. Gould.	.....

POLIOPTILA, Sclater.

Polioptila, Sclater, Pr. Zool. Soc. 1855, 11. (Type *Motacilla cærulea*, L.)

Since the note on this genus was published by Mr. Sclater, in 1855, enumerating four species, their number has greatly increased, as at the present time at least nine or ten may be considered as perfectly well established, possibly more. The species are very closely allied, and can only be readily distinguished by an examination of the males. In all the upper parts are plumbeous gray; the under white, more or less tinged with plumbeous. The tail feathers black, with the outer three or four more or less varied with white; the quills black; the primaries edged with ashy, the secondaries with white. The males all have black on the head; either the whole hood is black, or else gray, with a narrow line of black margining it above the eye, or a broad line through the eye.

The following synopsis may aid in determining the males of the different species of American *Polioptila*:—

Whole top of head above black.

No white between eye and bill or above it.

Outer tail feather black, except on outer web and extreme tip (about one-sixth or seventh). *Hab.* Rio Grande and Gila . . . . . *melanura.*

Outer tail feather white, except portion hidden by under tail coverts. Second feather white for terminal third; outline of white oblique, or along the fibres of the feather. Tarsus, .75; tail, 2.20. *Hab.* N. W. Mexico *nigriceps.*

Outer tail feather black at base, but with more white than last; outlines of white directly transverse. Tarsus, .69; tail, 2.45. *Hab.* Brazil . . . . . *leucogastra.*

Outer tail feather entirely white; 2d and 3d white nearly to base. *Hab.* Guiana and New Grenada . . *buffoni.*

Lores white; eyelids black.

Outer tail feather black at the base. *Hab.* Central Amer. *albiloris.*

Lores and short supra-ocular stripe white.

Inner web of outer tail feather white almost to base; next with basal third black: this color extending little further on the inner than the outer web. *Hab.* Panama *superciliaris.*

Inner web of outer tail feather black for basal third; next with basal half black: this color extending much more on inner than outer web. Size considerably larger. *Hab.* Carthagena . . . . . *bilineata.*

Sides of head black; top gray.

Under parts plumbeous, lighter than back. *Hab.* Eastern La Plata States . . . . . *dumicola.*

Under parts white, tinged with plumbeous. *Hab.* Bolivia . *boliviana.*

Top of head gray; sides whitish.

A black frontal line extending backwards over the eye. Lateral tail feather white, except at the base. Tail slightly graduated. First primary much less than half the second. *Hab.* North America . . . . . *cærulea.*

A black crescentic line beginning at top of eye and bordering the ear coverts. Lateral tail feather black for basal half on inner web. Tail much graduated. First primary more than half the second. *Hab.* Cuba . . *lembeyii.*

A black line above the eye, not reaching the bill or ear coverts. Lateral tail feather black on nearly the whole of inner web. Tail moderately graduated. First primary more than half the second. *Hab.* Arizona . . . *plumbea.*

Polioptila melanura.

Culicivora atricapilla, LAWRENCE, Ann. N. Y. Lyc. V, Sept. 1851, 124 (not of SWAINSON).

Culicivora mexicana, CASSIN, Illust. I, 1854, 164, pl. xxvii (not of BOJ.).

Polioptila melanura, LAWRENCE, Ann. N. Y. Lyc. VI, Dec. 1856, 168.—BAIRD, Birds N. Am. 1858, 382.—HEERMANN, P. R. R. R. vol. X (Williamson), 1859, 39.

Hab. San Diego to Fort Yuma and Cape St. Lucas.

Specimens of this species from Cape St. Lucas differ from those of San Diego described in the P. R. R. Report (7191), in having the whole of the outer web of the outer tail feather white, and in a rather larger white tip. The colors beneath are a little less ashy, though not of a pure white. The ash of the back is rather lighter and purer. The lores are rather lighter. The 1st primary is a little larger and broader.

It is possible that the restriction of the white of the outer web of the exterior tail feather to the outer half only is an unusual circumstance, as both Mr. Cassin and Mr. Lawrence, in their descriptions, speak of the entire outer web being white—the second feather being of the former character. Under these circumstances there will be little specific difference between the tails of *P. melanura* and *plumbea*. The female bird will then be separated by the light superciliary line and much shorter tarsi of *P. plumbea*—the latter measuring .63, instead of nearly .70 of an inch.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,191	..	♂	San Diego, Cal.	...	Lt. Williamson.	Dr. Heermann.
7,192	..	♀	"	...	"	"
12,906	323	♂	Cape St. Lucas.	...	J. Xantus.	.....
16,961	1,346	♀	"	...	.....	.....

Polioptila nigriceps.

Polioptila nigriceps, BAIRD, n. s.

♂. Above clear pure light bluish gray; beneath pure white, including the flanks. Entire top of the head and sides, including lower eyelids, lustrous black. A slight ashy tinge on the sides of the neck. Only a few feathers in the eyelids white. Outer tail feather white, except for the basal concealed third, as is also the outer web, except at the base, and the terminal fourth (or .65 of an inch) of the next. Third feather with the inner web tipped with white for about a quarter of an inch: perhaps in the unworn feather extending a little on the outer web. First primary broad, about half as long as the 2d. No white on secondaries, or else worn off in this specimen.

Length, about 4.50 inches; wing, 1.95; tail, 2.15; bill above, .48; from gape, .32; tarsus, .75.

Hab. Mazatlan.

This interesting new species of *Polioptila* resembles *P. melanura* in general appearance, but will be readily distinguished by the white outer tail feather and much purer white of the under parts. The gray above is lighter and clearer; the bill is larger (equal to that of *cærulea*), and the tarsi are longer. The black cap seems to extend farther down the side of the head, and along the nape.

The species appears well characterized by the length of the tarsi, which exceed those of any other species known to me; the bill is not so stout as, and decidedly shorter than that of *P. albiloris* (32,556), and there is no trace of white in the lores, or between eye and bill. The tail is longer; the 1st primary only half the 2d.

From *leucogastra* it differs in the smaller size, shorter bill and longer tarsi, narrower tail feathers and less amount of white on the tail, as well as different geographical distribution. *P. buffoni* has the outer tail feather entirely white, and the 2d and 3d white almost to the base. The tail is considerably shorter.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,781	294	♂	Mazatlan.	July, 1861.	J. Xantus.	.....

23,781. Type.

Polioptila leucogastra.

Sylvia leucogastra, MAX. Beit. III, 1830, 710.—*Polioptila leucogastra*, SCLATER, P. Z. S. 1855, 12 (in part).—IB. Cat. 1861, 12, no. 74.—*Culicivora leucogastra*, BURM. Th. Bras. Vögel, 1856, 111.

Culicivora atricapilla, SW. Zool. Ill. N. S. pl. lvii (not of LAWRENCE).

Culicivora dumecola, BON. Consp. 1850, 316 (not of VIEILLOT).

(No. 57, Mr. Lawrence's collection, from Bahia.) Above lead gray, darker towards the rump; top of head and sides to lower edge of the eye glossy black. Beneath clear white, with a tinge of plumbeous across breast and sides. Quills black, edged like the back, the alulæ and inner secondaries broadly with white. Tail feathers glossy black, except the three exterior, of which the outermost is black on the basal half of the inner web (rather less on the outer); the next has the black extended nearly half as much more (on the basal two-thirds); the next is black, with the terminal fourth white. The shafts throughout are black.

The length of the outer primary cannot be given, as the wings are not quite perfect.

Total length, 4.50; wing, 2.60; tail, 2.35; bill from forehead, .57, from nostril, .35; along gape, .64; tarsus, .71; middle toe and claw, .45.

Polioptila buffoni.

Polioptila buffoni, SCLATER, P. Z. S. 1861, 127.—Ib. Catal. 1861, 12, no. 73.

This black-headed species I have not seen. It is said by Dr. Sclater to differ in a considerably smaller size (length, 4.00; wing, 1.90; tail, 1.80; bill from gape, .60), a longer bill, and in having the outer tail feather entirely white, the second and third white almost to the base. In *leucogastra* the black is much more extended, as will be seen above.

Polioptila albiloris.

Polioptila albiloris, SALVIN, P. Z. S. 1860, 295 (Guatemala).

"This species has the pileus black, the lores white; the outer three tail feathers tipped with white, decreasing gradually in amount (none entirely white). There does not appear to be a superciliary stripe. Length, 4.30; wing, 1.90; tail, 2.00."—*Salvin.*

Hab. West Coast Central America.

In the collection before me are several skins from Central America which possess, to a certain extent, the characters of the specimen given above—the one coming nearest to it (32.556) having the back of a light gray color, the whole top and side of the head down to the lower edge of the eye black. There is a short white line from nostril towards, but not reaching the eye; the lores themselves are, however, black. The outer tail feather is white, except on the concealed base of the inner web, which is black; the next has this black reaching beyond the middle of the feather; the third has an oblique white tip. The bill is long; the 1st primary is little more than half the 2d. Length, about 4.00; wing, 1.85; tail, 2.00; tarsus, .67; bill from nostril, .35.

A second specimen (30.555) is very similar, but shows only the

slightest trace of the white near the bill—an occasional feather only being tipped with this color.

A female referred to this species is similar in general character, but without the black head; the bill rather larger. The whole loral region to bill and the eyelids are white.[1]

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,556	248	♂	Grenada, Nicar.	...	Acad. Nat. Sci.	.....
30,555	..	♂	W. coast Cent. Am.	...	Capt. J. M. Dow.	.....
30,554	..	♀	Realejo, C. A.	July 16, '63.	"	.....
34,101	..	♂	"	Feb. 1864	"	.....

Polioptila superciliaris.

Polioptila superciliaris, LAWRENCE, Ann. N. Y. Lyc. 1861, 304, 322 (Panama).

First primary broad, and more than half the second, which is equal in length to outer secondaries. Color above light ashy (paler than in *leucogastra*); secondaries margined with white. The top of the head and nape are glossy black; the sides, however, are white, excepting a short black line from the eye backwards, running into the black of the nape. In other words, a conspicuous white line from the bill over the eye (which is situated about opposite its middle) and involving the whole loral region. The tail is glossy black; the outer tail feather is entirely white to the base; the next is white, except for the basal third; the next white for rather less than the terminal third; the fourth feather has a narrow white tip. The shafts of the white portions of the tail feathers are white.

[1] Since the preceding article was written Mr. Salvin has kindly transmitted to me for examination his type specimens of *P. albiloris*, from Guatemala, and skins labelled *P. buffoni*, from La Union, Salvador. The former agree very well with the first described specimen of "*albiloris*," except that the bill is not so large nor so much decurved at the end, the lores are more nearly white—there being only a few blackish feathers in front of the eye (more perhaps on one side than on the other); the white of the tail feathers extends a little farther towards the base. No. 34,101, also received recently, agrees with the type, except in having the larger bill. I can see very little difference between Mr. Salvin's specimens of "*albiloris*" and of "*buffoni*," excepting in the color of the lores, and those described above, form two stages of intermediate gradation. I am, therefore, not disinclined to the impression that they all form one species. They all differ from *P. buffoni*, of Cayenne and Bogota, as first described by Dr. Sclater, in having nearly the basal third of the inner web of outer tail feather black, not white; the basal half of the inner web of the second, and the basal three-fourths of that of the third feather black, instead of being white, almost to the base.

The *P. nigriceps* differs from all these specimens in the longer tarsi and the oblique markings on the tail.

The female resembles the male, except in having the black of head replaced by ash, like the remaining upper parts. The white on the side of the head is not so distinctly defined as in the male, but the short superciliary stripe is distinctly appreciable.

Total length, 3.80; wing, 1.78; tail, 1.75; exposed portion of 1st primary, .83; of 2d, 1.15; of longest (measured from exposed base of 1st primary), 1.40; length of bill from forehead, .50, from nostril, .33; along gape, .55; tarsus, .57.

Hab. Isthmus of Panama.

This beautiful species, perhaps the least of the genus, is closely related to *P. bilineata*, from Carthagena. Sclater, however, describes this as having the tips of the outer lateral tail feather white, on which account Mr. Lawrence makes it distinct. As, however, Bonaparte, in his diagnosis of *P. bilineata* (Conspectus Avium, I, 1850, 316), gives the outer tail feathers as white, the question remains to be decided by reference to the type in the Berlin Museum.[1]

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	51	♂	Isthmus Panama.	...	Cab. Lawrence.	.....
..	51	♀	"	...	.....	.....
24,097	..	♂	"	...	Geo. N. Lawrence.	J. M'Leannan.

51 Type.

Polioptila bilineata??

Culicivora bilineata, Br. Consp. 1850, 316 (type from Carthagena, in Berlin Museum).—*Polioptila bilineata*, Sclater, P. Z. S. 1855, 12; 1860, 273.—Ib. Catal. 1861, 13, no. 75.

Hab. S. America: Carthagena; Ecuador (Esmeraldas, Babahoyo, *Sclater*).

A female specimen (No. 9,110) received from Mr. Verreaux, and referred to in the "Birds of North America," 381, as possibly the *bilineata*, has the characters of the species in the white lores and

[1] Since writing the preceding I have been favored by Dr. W. Peters, Director of the Berlin Museum, with a diagram of the outer two tail feathers of the type specimen of *P. bilineata*, and of their markings. He states that "the two outer tail feathers are white except at the base, which is black, in such a manner that the black extends much more on the inner part at the vexillum than on the outer part." The diagram represents much broader tail feathers than those of *superciliaris*, with considerably more black at the base; this color on the inner web extending a quarter of an inch further than on the outer, in the first feather covering more than one-third, in the second about one half of the web. In *superciliaris* the amount of black is considerably less, and extends little more on the inner than on the outer web.

the superciliary stripe; but the locality assigned, of "Mexico," is opposed to the idea of its being the true *bilineata*. It is much larger than the female of *superciliaris*, with the white on side of head much purer, though otherwise similar. The outer tail feather is entirely white, except at the concealed base; the next has basal half of inner web black, this color extending much beyond the black of outer web; the third is white for the terminal fourth or fifth. The 1st quill is more than half the 2d. It is specifically distinct, without doubt, from *superciliaris*, and if not *bilineata*, and really from Mexico, probably indicates the existence of a third species with black head. Compared with a supposed female of *P. albiloris*, the bill is weaker, size larger, more white on the head and tail, etc.[1]

Total length, 4.50; wing, 1.85; tail, 2.10; exposed portion of 1st primary, .68, of 2d, 1.28, of longest (measured from exposed base of 1st primary), 1.44; length of bill from forehead, .55, from nostril, .33; along gape, .60; tarsus, .70.

Smithsonian No.	Collector's No.	Sex and Age	Locality.	When Collected.	Received from	Collected by
9,110	31,390	♀ ?	"Mexico."	...	Verreaux.	.....

Polioptila dumicola.

Sylvia dumicola, VIEILL. Nouv. Dict. XI, 170.—IB. Encycl. Méth. II, 1823, 433.—*Polioptila dumicola*, SCLATER, P. Z. S. 1855, 12.—*Culicivora dumicola*, BURM. Reise La Plata, II, 1861, 473 (Montevideo and Parana).

? *Culicivora boliviana*, SCLATER, P. Z. S. 1852, 34, pl. 47 (Bolivia).

Hab. La Plata States; Bolivia?

I am by no means satisfied that the *boliviana*, of Sclater, is not a different species from *dumicola*, at least Smithsonian specimens from the two localities are readily distinguishable. The La Plata bird is nearly uniform lead gray below, including the lining of the wing; on the throat and breast not very much lighter than on the back, becoming paler posteriorly, but nowhere white. In the Bolivian the under parts may be called dull white, with a slight tinge of plumbeous on the throat, and a rather deeper shade of the same across the breast; the cheeks below the black patch are quite clear white, and not dark plumbeous. The light edgings on the wings are more conspicuous.

[1] The tail feathers are almost too much worn for comparison with the diagram furnished by Prof. Peters, but they do not appear materially different.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,376	8	♂	Buenos Ayres.	...	Capt. T. J. Page.	.....
12,372	8	♀	"	...	.....	.....
16,338?	54	♀	Paraguay.	June, 1859.	.....	.....
16,336	54	♀	Brazil.	Oct. 1859.	.....	.....
16,848	..	♂	Bolivia.	...	Walter Evans.	.....
16,847	..	♀	"	...	"	.....

12,376. Steamer Argentina. 12,372. Do. 16,338? Expl. of Parana. 16,336. Do.

Polioptila plumbea.

Polioptila plumbea, BAIRD, Pr. A. N. Sc. VII, June, 1854, 118.—IB. Birds N. Am. 1858, 382, pl. xxxiii, fig. 1.

Hab. Arizona.

The only specimens received additional to those mentioned in Birds N. A. are Nos. 11,541 and 11,542, collected at Fort Yuma, by Lt. Ives. The species appears to be confined to Arizona.

Polioptila cærulea.

Motacilla cærulea, LINN. Syst. Nat. I, 1766, 337 (based on *Motacilla parva cærulea*, EDW. tab. 302).—*Culicivora cærulea*, CAB. Jour. 1855, 471 (Cuba).—*Polioptila cærulea*, SCLATER, P. Z. S. 1855, 11.—IB. Catal. 1861, 12, no. 70.—BAIRD, Birds N. Am. 1858, 380.

Motacilla cana, GM. S. N. I, 1788, 973.

? *Culicivora mexicana*, BON. Consp. 1850, 316 (not of CASSIN), female.—*Polioptila mexicana*, SCLATER, P. Z. S. 1859, 363, 373.—IB. Catal. 1861, 12, no. 71.

Figures: VIEILL. Ois. II, pl. 88.—WILSON, Am. Orn. II, pl. xviii, fig. 3.—AUD. Orn. Biog. I, pl. 84.—IB. B. A. I, pl. 70.

Hab. Middle region of U. S., from Atlantic to Pacific, and south to Guatemala. Cuba, *Gundlach* and *Bryant*.

A winter specimen, from near Cape St. Lucas, of *P. cærulea*, has the ash of the back washed with a brownish tinge. I have not seen this in any other specimens to anything like the same extent.

After a careful examination of Mexican specimens, labelled *P. mexicana* by Mr. Verreaux, and of others received from Guatemala, I am unable to distinguish them from *P. cærulea*. One of these, No. 22,418 (38,658 of Verreaux), has the black frontal line, and the same pure bluish ash of northern specimens. The lores are perhaps a little whiter than usual, not more so than in specimens from Tamaulipas and Illinois.

All these specimens from the south agree with northern *cærulea* in the small, rather narrow, falcate first primary, scarcely two-thirds

the exposed portion of the second. In all the other species before me this primary is larger, broader, and as long as or longer than the remaining exposed portion of the second.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
504	..	..	New York.	...	S. F. Baird.	.....
1,835	..	..	Philadelphia.	...	"	.....
615	..	♂	Washington, D. C.	April 5, '42.	"	Wm. M. Baird.
616	..	♀	"	"	"	"
29,483	1,164	♀	"	April 18, '61.	E. Coues.	.....
2,401	..	..	Savannah, Ga.	1845.	S. F. Baird.	.....
8,671	..	♂	Indian Key, Fla.	Aug. 27, '57.	G. Wurdemann.	.....
10,213	..	..	Union County, Ill.	April 20.	R. Kennicott.	.....
10,214	..	♂	South Illinois.	May 15.	"	.....
4,682	..	♂	Bald Island, Neb.	April 25, '56.	Lt. Warren.	Dr. Hayden.
5,641	15	♂	East of Fort Riley.	June 16, '56.	Lt. Bryan.	W. S. Wood.
7,188	..	..	Fort Thorn, N. M.	...	Dr. T. C. Henry.	.....
7,193	..	♀	Organ Mts., Tex.	...	Major Emory.	J. H. Clark.
4,593	34	♀?	Colorado Riv., Cal.	...	"	A. Schott.
21,371	..	..	Yreka, Cal.	May 26.	W. Vuille.	.....
29,748	1,790	♂	Maryville, Cal.	April 24, '63.	F. Gruber.	.....
13,742	209	♂	Fort Tejon, Cal.	...	J. Xantus.	.....
31,888	..	♂	San Diego, Cal.	Dec. 5, '61.	Geol. Surv. Cal.	Dr. J. G. Cooper.
16,960	5,249	..	Cape St. Lucas.	Oct. 10, '59.	J. Xantus.	.....
17,290	3,409	..	"	...	"	.....
3,985	..	♂	Tamaulipas, Mex.	1853.	Lt. Couch.	.....
31,823?	1,656	♂	Colima, Mex.	Aug. 1863.	"	.....
9,223	..	..	Mexico.	...	J. Gould.	.....
22,418	38,658	♂	Coban.	...	Verreaux.	.....
9,222	..	..	Guatemala.	...	J. Gould.	.....

9,223. "*P. mexicana.*"

Family CHAMÆADÆ.

Bill compressed, short, rather conical, not notched nor decurved. Culmen sharp-ridged. Nostrils linear, with an incumbent scale. Rictal bristles reaching beyond nostrils, which are scantily overhung by bristly feathers. Loral feathers bristly and directed forwards. Tarsi booted, or covered with a continuous plate anteriorly, with faint indications of scutellæ on the inner side. Basal joint of middle toe attached for about half its length on either side. Primaries ten; 6th quill longest. Plumage very lax.

I have found it impossible to assign the genus *Chamæa* to any recognized family of American birds, and have accordingly been obliged to give it independent rank in this respect, although it may properly belong to some old world group with which I am not acquainted. In its general appearance it approaches the *Paridæ* in loose plumage, bristly lores, want of notch to bill, etc.; but differs in the very much bristled rictus, sharp-ridged culmen, linear nostrils, booted tarsi, less amount of adhesion of the toes, etc. It approaches

Smiths. number. No.	Coll.'s No.	Sex and age.	Locality.	When collected.	Received from.	Collected by.
22,571	4	♂	Buenos Ayres.	...	Capt. T. J. Page.	...
22,572	4	♀	"	...	...	...
14,388*	54	♀	Paraguay.	June, 1858.	...	...
11,388	56	♀	Brazil.	Oct. 1858.	...	...
10,648	...	♂	Bolivia.	...	Walter Evans.	...
10,647	...	♀	"	...	"	...

22,571 Buenos Aryensis. 22,572 Do. 14,388* Engl. of Paraua. 11,388 Do.

Polioptila plumbea.

Polioptila plumbea, Baird, Pr. A. N. Sc. VII, June, 1854, 115.—Ib. Birds N. Am. 1858, 392, pl. xxxiii, fig. 1.

Hab., Arizona.

The only specimens received additional to those mentioned in Birds N. A. are Nos. 11,541 and 11,542, collected at Fort Yuma by Lt. Ives. The species appears to be confined to Arizona.

Polioptila cærulea.

Motacilla cærulea, Linn. Syst. Nat. I, 1766, 337 (based on *Motacilla parra cærulea*, Briss. tab. 302).—*Culicivora cærulea*, Cab. Jour. 1853, 471 (Cuba).—*Polioptila cærulea*, Sclater, P. Z. S. 1855, 11.—Ib. Catal. 1861, 12, no. 70.—Baird, Birds N. Am. 1858, 389.

Motacilla cana, Gm. S. N. I, 1788, 973.

†*Culicivora mexicana*, Bon. Consp. 1850, 316 (not of Cassin), female.—*Polioptila mexicana*, Sclater, P. Z. S. 1859, 363, 373.—Ib. Catal. 1861, 12, no. 71.

Figures: Vieill. Ois. II, pl. 88.—Wilson, Am. Orn. II, pl. xviii, fig. 3.—Aud. Orn. Biog. I, pl. 84.—Ib. B. A. I, pl. 70.

Hab. Middle region of U. S., from Atlantic to Pacific, and south to Guatemala. Cuba, *Gundlach* and *Bryant*.

A winter specimen, from near Cape St. Lucas, of *P. cærulea*, has the ash of the back washed with a brownish tinge. I have not seen this in any other specimens to anything like the same extent.

After a careful examination of Mexican specimens, labelled *P. mexicana* by Mr. Verreaux, and of others received from Guatemala, I am unable to distinguish them from *P. cærulea*. One of these, No. 22,418 (38,658 of Verreaux), has the black frontal line, and the same pure bluish ash of northern specimens. The lores are perhaps a little whiter than usual, not more so than in specimens from Tamaulipas and Illinois.

All these specimens from the south agree with northern *cærulea* in the small, rather narrow, falcate first primary, scarcely two-thirds

Family PARIDÆ.

Bill generally short, conical, not notched nor decurved at tip. Culmen broad and rounded, not sharp-ridged at base. Nostrils rounded, basal, and concealed by dense bristles or bristly feathers. Loral feathers rough and bristly, directed forwards. Tarsi distinctly scutellate; basal joints of anterior toes abbreviated, that of middle toe united about equally for three-fourths its length to the lateral: in *Parinæ* forming a kind of palm for grasping; outer lateral toe decidedly longer than the inner. Primaries ten: the 1st much shorter than the 2d. Tail feathers with soft tips.

With Cabanis I include the Nuthatches in the same family with the Titmice, and have prepared the above diagnosis to include both groups. They agree in having a conical bill, not notched nor decurved, with much rounded culmen, and nearly straight commissure, and rounded nostrils covered with dense bristles. These characters will readily distinguish them, in connection with the ten primaries, and tarsi with scutellæ on the anterior half only (as compared with *Alaudidæ*), from any other American *Oscines*.

The two subfamilies may be thus distinguished :—

Parinæ. Body compressed. Bill shorter than the head. Wings rounded, equal to, or shorter than the rounded tail. Second quill as short as the 10th. Tarsus longer than the middle toe and claw, which are about equal to the hinder; soles of toes widened into a palm. Plumage rather soft and lax.

Sittinæ. Body depressed. Bill about equal to, or longer than the head. Wings much pointed, much longer than the nearly even tail. Tarsus shorter than the middle toe and claw, which are about equal to the hinder. Plumage more compact.

Among the *Parinæ* are several extremes of form, but the American species are sufficiently allied to allow them to be united into one subfamily.

Subfamily PARINÆ.

LOPHOPHANES, Kaup.

Lophophanes, Kaup, Entw. Gesch. Europ. Thierw. 1829. (Type *Parus cristatus.*)
Bæolophus, Cabanis, Mus. Hein. I, 1850–51, 91. (Type *Parus bicolor*, L.)

Cabanis, as quoted above, makes a new genus for our Tufted Titmouse, on the ground of a difference in the crest, and in having

stouter bill and feet, and longer legs. As, however, our other species vary considerably in this respect, I can hardly consider these as more than specific differences.

Lophophanes bicolor.

Parus bicolor, LINN. Syst. Nat. 12th ed. I, 1766, 340 (based on *Parus cristatus*, CATESBY, I, pl. 57).—PR. MAX. Cab. Jour, VI, 1858, 118.—*Lophophanes bicolor*, BON. List Birds Europe, 1842.—BAIRD, Birds N. Am. 1858, 384.—SCLATER, Catal. 1861, 14, no. 87.—*Bæolophus bicolor*, CAB. Mus. Hein. I, 1850, 91 (type of genus).

Lophophanes missouriensis, BAIRD, Birds N. Am. 1858, 384 (var. from Missouri River).

Figures: WILSON, Am. Orn. I, pl. viii, fig. 5.—AUD. Orn. Biog. I, pl. 301.—IB. Birds Am. II, pl. 125.

Hab. United States, from Missouri valley eastward.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
823	..	♂	Carlisle, Pa.	Oct. 20, '42.	S. F. Baird.	S. F. Baird.
1,292	..	♀	"	May 11, '44.	"	.....
28,958	575	♂	Washington, D. C.	Jan. 16, '60.	Dr. E. Coues.	.....
29,956	..	..	"	Sept. 24, '60.	D. W. Prentiss.	.....
32,281	..	♀	Liberty Co., Ga.	...	Prof. J. Leconte.	.....
20,921	..	..	Illinois.	...	R. Kennicott.	.....
29,675	..	..	Springfield, Ill.	...	P. M. Springer.	.....
4,730	..	..	Fort Leavenworth.	April 21, '54.	Lt. D. N. Couch.	.....
6,752	..	..	"	Jan. 20, '55.	"	.....
4,731	..	..	St. Joseph, Mo.	April 22, '56.	Lt. Warren.	Dr. Hayden.

(823.) 6.25; 10; 3.17. (1,292.) 5.66; 9.66; 3.08. (28,958.) 6.30; 10.30; 3.20. (32,281.) 5.80; 9.50; 3.00. 6,752. Type of var. *missouriensis*. 4,731. Eyes dark-brown.

Lophophanes atricristatus.

Parus atricristatus, CASSIN, Pr. A. N. Sc. Phil. V, 1850, 103, pl. ii (Texas). *Lophophanes atricristatus*, CASSIN, Ill. Birds Texas, etc. I, 1853, 13, pl. iii.—BAIRD, Birds N. Am. 1858, 385.

Hab. Valley of Rio Grande, south.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,107	..	♂	San Antonio, Tex.	April 13, '51.	Capt. Sitgreaves.	Dr. Woodhouse.
6,756	..	..	Fort Clarke, Tex.	...	Lt. J. G. Parke.	Dr. Heermann.
3,974	96	♂	New Leon, Mex.	...	Lt. D. N. Couch.	.....
3,975	97	♀	"	...	"	.....
9,111	29,713	..	Mexico.	...	Verreaux.	.....
22,416	29,856	..	"	...	"	.....

Lophophanes inornatus.

Parus inornatus, GAMBEL, Pr. A. N. Sc. Phil. Aug. 1845, 265 (Upper California).—IB. J. A. N. Sc. new ser. I, 1847, 35, pl. vii.—*Lopho-*

phanes inornatus, CASSIN, Ill. 1853, 19.—BAIRD, Birds N. Am. 1858, 386.—SCLATER, Catal. 1861, 14, no. 88.

Hab. Southern United States, from Rocky Mts. to Pacific.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
5,515	..	♂	Petaluma, Cal.	...	E. Samuels.	.....
5,923	..	..	Santa Clara, Cal.	...	Dr. J. G. Cooper.	.....
12,904	104	..	Napa Valley, Cal.	...	A. J. Grayson.	.....
4,951	18	..	San Jose, Cal.	...	"	.....
25,354	1,496	♂	Fort Tejon, Cal.	Jan. 1858.	J. Xantus.	.....
12,106	..	♂	San Francisco Mts.	Oct. 9.	Capt. Sitgreaves.	Dr. Woodhouse.
11,543	81	♂	Fort Defiance, N. M.	...	Lt. J. C. Ives.	H. B. Möllhausen.
6,753	..	..	Fort Thorn, N. M.	...	Dr. T. C. Henry.	.....

Lophophanes wollweberi.

Lophophanes wollweberi, BON. C. R. XXXI, Sept. 1850, 478.—WESTERMANN, Bijdr. Dierkunde, III, 1851, 15, plate.—BAIRD, Birds N. Am. 1858, 386, pl. liii, fig. 1.—SCLATER, P. Z. S. 1858, 299 (Oaxaca, high lands).—IB. Catal. 1861, 14, no. 89.

Parus annexus, CASSIN, Pr. A. N. Sc. V, Oct. 1850, 103, pl. i.

Lophophanes galeatus, CABANIS, Mus. Hein. 1850–51, 90.

Hab. Southern Rocky Mountains of U. S., and along table lands through Mexico, to Oaxaca.

No additional materials relative to this species have been received since 1858.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,794	3	♀	Copper Mines, N. M.	...	Col. J. D. Graham.	J. H. Clark.
6,797	..	..	Fort Thorn, N. M.	...	Dr. T. C. Henry.	.....
6,795	50	..	Pueblo Creek, N. M.	Jan. 22, '54.	Lt. A. W. Whipple.	Dr. Kennerly.
9,221	..	..	Mexico.	...	J. Gould.	.....

PARUS, LINN.

Parus, LINN. Syst. Nat. 1735. (Type *Parus major.*)—IB. Fauna Suecica, 238. (Type *P. major.*)—IB. Syst. Nat. 1758, 189. (Type *Parus cristatus.*)

Parus septentrionalis.

Parus septentrionalis, HARRIS, Pr. A. N. Sc. II, 1845, 300.—CASSIN, Illust. I, 1853, 17, 80, pl. xiv.—BAIRD, Birds N. Am. 1858, 389.—SCLATER, Catal. 1861, 14, no. 82.—*Parus septentrionalis*, var. *albescens*, BAIRD, Birds N. Am. 1858, xxxvii.

?*Parus atricapillus*, PR. MAX. Cab. Jour. VI, 1858, 119.

Hab. Region of Missouri River to Rocky Mts.

Thus far I have seen none of the common Black-capped Titmouse (*P. atricapillus*), from the line of the Missouri River and westward to the Rocky Mountains, that were not referable to the long tailed species. Specimens vary in amount of white on the wings and tail, but the real characters are pretty constant. The specimens at present in the collection, however, are not in sufficiently good condition, nor numerous enough, to exhibit the exact limitations of the two species.

I have already referred (B. N. A. 389) to specimens from the southern Rocky Mountains (Fort Massachusetts), in which the white markings are of a plumbeous tinge. Some others, since received, exhibit this same character, and it is not impossible that it may indicate a specific form. The specimens, however, are not in sufficiently good condition to settle the question, but their general appearance is more that of *Parus meridionalis*, than the North American Black-caps.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
19,567	147	♀	Ft. Simpson, H. B. T.	April 23, '60	B. R. Ross.	.....
20,286	254	..	"	Oct. 19, '59.	R. Kennicott.	.....
19,568	306	..	Fort Liard.	Jan. 12, '60.	"	.....
13,700	..	..	Lake Winnipeg.	June 6, '59.	"	.....
27,049	..	..	Fort Garry.	...	Donald Gunn.	.....
6,765	..	..	Fort Leavenworth.	...	Lt. Couch.	.....
4,733	..	♂	Mo. of Big Nemaha.	April 2, '56.	Lt. Warren.	Dr. Hayden.
20,338	..	..	Fort Randall.	...	Capt. J. P. M'Cown.	.....
5,873	..	..	Fort Riley.	1856.	Jno. Xantus.	.....
13,175	89	..	Near Fort Benton.	...	Lt. Mullan.	J. Pearsall.
17,561	261	♀	Teton River.	...	"	"
11,082	..	..	Fort Bridger.	April 10, '58	C. Drexler.	.....
22,049	78	..	Hellgate, Idaho.	Aug. 28, '60.	Dr. Cooper.	.....
8,828	..	..	Black Hills.	Sept. 15.	Lt. Warren.	Dr. Hayden.
13,779	15	..	Fort Massachusetts,	...	Capt. A. W. Bow-	.....
13,780	..	..	" [N. M.	...	" [man.	.....
11,472	..	..	"	...	"	.....
11,473	..	..	"	...	"	.....
11,474	..	..	"	...	"	.....

(8,828.) 5.50; 2.75. (11,472.) Plumbeous variety. (11,473.) Do. (11,474.) Do.

Parus atricapillus.

Parus atricapillus, LINN. Syst. Nat. I, 1766, 341 (based on *Parus atricapillus canadensis*, BRISSON, III, 553, tab. xxix, fig. 1).—BAIRD, Birds N. Am. 1858, 390.—SCLATER, Catal. 1861, 13, no. 80.—*Pœcila atricapilla*, BON. Consp. 1850, 230.

Parus palustris, NUTT. Man. I, 1832, 79.

Figured by AUDUBON, WILSON, etc.

Hab. Eastern North America.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,694	..	♀	Portsmouth, N. H.	Jan. 8.	Elliot Coues.	.....
12,851	..	♂	Brooklyn, N. Y.	...	J. Akhurst.	.....
830	..	♀	Carlisle, Pa.	Oct. 22, '42.	S. F. Baird.	.....
29,676?	..	..	Springfield, Ill.	...	P. M. Springer.	.....
29,668?	..	..	Temiscamingue, Can. [H. B.	...	Thos. Richards.	.....
32,344	..	..	Moose Factory,	1862.	J. Mackenzie.	.....

(830.) 5.00; 7.75; 2.50.

Parus occidentalis.

Parus occidentalis, Baird, Birds N. Am. 1858, 391 (W. Territory).—Sclater, Catal. 1861, 14, no. 82.

Hab. Northwest coast region of the United States.

No specimen of this species has been received for several years.

Parus meridionalis.

Parus meridionalis, Sclater, P. Z. S. 1856, 293 (El Jacale, Mex.).—Ib. 1857, 81; 1858, 299.—Ib. Catal. 1861, 14, no. 83.—Baird, Birds N. Am. 1858, 392.

Not figured.

Hab. Eastern Mexico.

As already shown in Birds N. Am., this bird is very different from the United States species in the absence of any lighter edgings on the greater wing coverts (seen in all the others), in the almost entire absence of whitish edging to the quills and tail, and in the ashy, instead of the rusty, flanks and crissum. The size is about that of the *Parus atricapillus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,203	..	..	Mexico. [region.)	...	Dr. P. L. Sclater.	.....
32,470	392	..	Orizaba. (Alpine	...	Prof. F. Sumichrast.	.....
32,736	44,730	..	Mexico.	...	Verreaux.	.....

Parus carolinensis.

Parus carolinensis, Aud. Orn. Biog. II, 1834, 474, pl. 160.—Ib. Birds Am. II, 1841, 152, pl. 127.—Baird, Birds N. Am. 1858, 392.—Sclater, Catal. 1861, 13, no. 81.—*Pœcila carolinensis*, Bon. Consp. 1850, 230.

Hab. South Atlantic and gulf region of U. S.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,514	..	♂	Cape May Co., N. J.	...	J. K. Townsend.	.....
607	..	♂	Washington, D. C.	Feb. 22, '42.	W. M. Baird.	.....
706	..	..	"	April 5, '42.	"	.....
11,971	..	♀	"	May 1, '59.	C. Drexler.	.....
29,942	301	♀	"	...	D. W. Prentiss.	.....
19,088	60	♂	Fort Cobb, Ark.	May 20, '60.	J. H. Clark.	C. S. M'Carthy.

(607.) 4.25; 6.50. (706.) 4.60; 7.00. (11,971.) 4.80; 7.32.

Parus montanus.

Parus montanus, GAMBEL, Pr. A. N. Sc. April, 1843, 259 (Santa Fé).—IB. Jour. A. N. Sc. new ser. I, 1847, 35, pl. viii, fig. 1.—BAIRD, Birds N. Am. 1858, 394.—SCLATER, Catal. 1861, 14, no. 84.

Hab. Mountain regions of Middle and Western United States.

Several variations in coloration and other characters will be found mentioned in the Birds N. Am., as quoted above, but nothing apparently of specific value.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,390	171	..	Fort Dalles, Oregon.	Feb. 1855.	Dr Suckley.	.....
21,959	582	..	Colville Depot, W. T.	Mar. 0, '60.	A. Campbell.	Dr. Kennerly.
21,957	593	..	"	July 15, '60.	"	"
22,041	..	..	Bitter-root Mts.	Sept 3, '60.	Dr. J. G. Cooper.	.....
17,556	614	..	"	...	Lt. Mullan.	J. Pearsall.
16,206	60	♀	Fort Crook, Cal.	...	John Feilner.	.....
21,466	..	..	"	...	D. F. Parkinson.	.....
25,710	1,266	..	Fort Tejon, Cal.	Dec. 1860.	John Xantus.	.....
10,544	64	♂	San Francisco Mts.	...	Capt. J. C. Ives.	Mollhausen.
5,643	222	♀	Medecine, Bow Cr'k.	Aug. 6, '56.	Lt. Bryan. [man.	W. S. Wood.
11,475	..	..	Fort Massachusetts.	...	Capt. A. W. Bow-	.....
10,712	..	..	Ft. Burgwyn, N. M.	...	Dr. W. W. Ander- [son.	.....

(22,041.) Iris brown.

Parus hudsonicus.

Parus hudsonicus, FORSTER, Philos. Trans. LXII, 1772, 383, 430.—AUD. Orn. Biog. II, 1834, 543, pl. 194.—IB. Birds Am. II, 1841, 155, pl. 128.—BAIRD, Birds N. Am. 1858, 395.

Hab. Northeastern portions of North America.

Specimens from the most northern localities appear larger than those from Maine and Nova Scotia, with proportionally longer tails (3.00 inches, instead of 2.40). I can, however, detect no other difference, although I have access to but a few skins from southern points. This difference is much the same as between *P. atricapillus* and *septentrionalis;* to which variety the original *P. hudsonicus*

belongs, yet remains to be determined, and to which, if any, a new name is to be given.

The *Parus sibiricus*, of Europe, is very similar in coloration and characters to the *P. hudsonicus*. The principal difference is seen in the cheeks, which in *sibiricus* are pure white, this color extending along the entire side of the neck, widening behind, and extending round towards the back. In *hudsonicus* the cheeks behind the eyes and sides of neck are ash gray, the white being confined to the region below or near the eye. The smoky gray of the upper part of head and neck in *sibiricus* is in a stronger contrast with the brighter rufescent gray of the back, and is separated from it by an obscure concealed whitish dorsal half collar, represented in *hudsonicus* only by a dull grayish shade in the plumage.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,087	157	..	Rigolet, Lab.	July 13, '59.	E. Coues.	.....
17,101	..	..	Halifax, N. S.	...	J. R. Willis.	.....
2,926	..	..	Eastern N. America.	...	S. F. Baird.	J. J. Audubon.
27,349	1,308	..	Ft. Youkon.	February.	R. Kennicott.	.....
19,559	256	..	Ft. Simpson.	Oct. 19, '59.	"	.....
27,346	1,918	♀	"	April.	B. R. Ross.	.....
19,553	315	..	Ft. Liard.	Jan. 20.	R. Kennicott.	.....
19,566	..	..	Big Island, G. S. L.	...	J. Reid.	.....
22,276	920	..	Ft. Rae, G. S. L.	May, 1860.	L. Clarke, Jr.	.....

Parus rufescens.

Parus rufescens, TOWNSEND, J. A. N. Sc. Phil. VII, II, 1837, 190.—AUD. Orn. Biog. IV, 1838, 371, pl. 353.—IB. Birds Am. 1841, 158, pl. 129.—BAIRD, Birds N. Am. 1858, 394.—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 1859, 194 (nesting).—SCLATER, Catal. 1861, 14, no. 86.—*Pœcila rufescens*, BONAP. Consp. 1850, 230.

Hab. Western United States near Pacific coast.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,444	437	♀	Simiahmoo, W. T.	Dec. 23, '59.	A. Campbell.	Dr. Kennerly.
11,812	222	..	Chiloweyuck, W. T.	Sept. 27.	"	"
21,955	..	..	Kootenay Camp.	...	"	"
6,778	..	..	Ft. Steilacoom, W. T.	Mar. 1856.	Dr. Geo. Suckley.	.....
6,786	41	..	Ft. Vancouver.	Dec. 29, '53.	Gov. I. I. Stevens.	Dr. Cooper.
2,931	..	..	Columbia River.	...	S. F. Baird.	J. K. Townsend.
1,924	..	..	"	...	"	.....
6,784	..	..	San Francisco?	...	Lt. Williamson.	Dr. Heermann.
22,415	40,752	♂	California.	...	Verreaux.	.....

PSALTRIPARUS, Bonap.

Psaltriparus, Bonap. C. R. XXXI, 1850, 478. (Type *P. melanotis.*)
Ægithaliscus, Cabanis, Mus. Hein. I, 1850, 90. (Type *Parus erythrocephalus.*)

Psaltriparus melanotis.

Parus melanotis, Hartlaub, Rev. Zool. 1844, 216.—*Pœcila melanotis*, Br. Consp. 1850, 230.—*Ægithaliscus melanotis*, Cab. Mus. Hein. I, 1850–51, 90.—*Psaltria melanotis*, Westermann, Bijdrag. Dierk. 1851.—*Psaltriparus melanotis*, Bonap. C. R. XXXVIII, 1854.—Sclater, P. Z. S. 1858, 299.—Baird, Birds N. Am. 1858, 386, pl. liii, fig. 3.

Psaltriparus personatus, Bonap. C. R. XXXI, Sept. 1850, 478.—*Psaltria personata*, Westermann, Bijd. Dierk. 1851, 16, plate.

Hab. Eastern Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,711	..	♂	Cayuilalpam, Mex.	Dec. 1860.	A. Sallé.	.....
..	54	..	Mexico.	...	Cab. Lawrence.	.....

Psaltriparus minimus.

Parus minimus, Townsend, J. A. N. Sc. VII, II, 1837, 190.—Aud. Orn. Biog. IV, 1838, 382, pl. 382, figs. 5, 6.—Ib. Birds Am. II, 1841, 160, pl. 130.—*Pœcila minima*, Bon. Consp. 1850, 230.—*Psaltria minima*, Cassin, Illust. 1853, 20.—*Psaltriparus minimus*, Bon. C. R. XXXVIII, 1854, 62.—Baird, Birds N. Am. 1858, 397.—Cooper & Suckley, P. R. R. Rep. XII, II, 1859, 195.

Hab. Pacific coast of United States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,756	336	♂	Ft Steilacoom, W. T.	...	Dr. Suckley.	.....
6,760	..	♂	Sacramento Valley,	...	Lt. Williamson.	Dr. Heermann.
12,895	..	♀	Napa Valley. (Cal.	...	A. J. Grayson.	.....
29,745	1,191	..	Auburn, Cal.	Dec. 10, '62.	Ferd. Gruber.	.....
..	..	..	Fort Tejon, Cal.	...	J. Xantus.	.....
22,417	40,644	♂	California.	...	Verreaux.	.....

Psaltriparus plumbeus.

Psaltria plumbea, Baird, Pr. A. N. S. VII, June, 1854, 118 (Little Colorado).—*Psaltriparus plumbeus*, Baird, Birds N. Am. 1858, 398, pl. xxxiii, fig. 2.—Sclater, Catal. 1861, 398, no. 77.

Hab. Southern Rocky Mountain region of United States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,774	94	..	Camp 120, Arizona.	Feb. 12, '54.	Lt. Whipple.	Dr. Kennerly.
6,777	63	..	" 111, "	Feb. 1, '54.	"	"
33,003	40	..	Little Colorado.	Nov. 1853.	"	"
11,729	..	..	Cantonment Burgwyn.	...	Dr. W. W. Anderson.	.....
6,770	..	..	Fort Thorn, N. M.	...	Dr. T. C. Henry.	.....

(6,774.) Iris yellow. (6,777.) Iris black. (33,003.) Iris black.

AURIPARUS, Baird.

Auriparus, Baird, n. g. (Type *Ægithalus flaviceps*, Sund.)

In the "Birds of North America," p. 399, while defining the generic characters of *Paroides*, I showed that the *Ægithalus flaviceps*, of Sundevall, differed very materially from the *P. pendulinus*, the type of the genus. The discrepancy, in fact, is too great to permit the two species to be associated, and I have consequently been obliged to establish a new generic name. The peculiarities authorizing this course will be found detailed in the work cited above. They consist, as compared with other American forms, in the long pointed quills, and the very small claws; the tarsi are much shorter than in *Psaltriparus*.

The single known species of the genus builds a covered nest of stiff, short pieces of grass, with a hole in the side, in bushes. The eggs are spotted, as in the Black-headed Titmice, not white, as in *Psaltriparus minimus*.

Auriparus flaviceps.

Ægithalus flaviceps, Sundevall, Ofversigt af Vet. Ak. Förh. VII, v, 1850, 129.—*Psaltria flaviceps*, Scl. P. Z. S. XXIV, March, 1856, 37.—*Psaltriparus flaviceps*, Scl. Catal. Am. Birds, 1861, 13, no. 79.—*Paroides flaviceps*, Baird, Birds N. Am. 1858, 400, pl. —, fig. 2.—*Auriparus flaviceps*, Baird.

Conirostrum ornatum, Lawrence, Ann. N. Y. Lyc. May, 1851, 113, pl. v, fig. 1 (Texas).

Hab. Valleys of the Rio Grande and Colorado: Cape St. Lucas.

This interesting species appears confined to the basins of the Rio Grande and Gila, extending to Cape St. Lucas, where it is very abundant. An immense number of its curiously shaped nests were collected by Mr. Xantus. Cape St. Lucas specimens of this, as of the other species, are much smaller than those from the more northern localities: thus, in No. 12,967, ♂, the wing measures 1 90,

the tail 1.80; while in 6,764 (♀?), from El Paso, the wing is 2.15, and the tail 2.25. The Cape St. Lucas specimens are brighter, and the top of head just behind the forehead has the feathers strongly tinged with reddish-orange.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
...	..	..	Matamoras.	...	Lt. Couch.	Dr. Berlandier.
6,774	34	..	El Paso, Mex.	Dec. 26, '54.	Maj. Emory.	J. H. Clark.
4,015	218	..	Saltillo, Mex.	...	Lt. Couch.	.....
11,546	..	♀	Fort Yuma, Cal.	...	Lt. J. C. Ives.	Möllhausen.
11,548	...	..	"	...	"	"
12,967	11	♂	Cape St. Lucas.	...	John Xantus.	.....
12,968	72	♂	"	...	"	.....

SUBFAMILY SITTINÆ.

SITTA, LINNÆUS.

Sitta, LINNÆUS, Syst. Nat. 1735 and 1758, 115. (Type *S. europæa*.)—REICHENBACH, Handbuch, No. IX, 1853, 149. (Monograph of genus.)

Sitta carolinensis.

Sitta europæa, var. γ, *carolinensis*, GM. S. N. I, 1788, 440.

Sitta carolinensis, LATH. Ind. Orn. I, 1790, 262; also of all other American writers.—REICHENBACH, Handbuch, Abt. II, 1853, 153, tab. dxiii, figs. 3,563–4.—BAIRD, Birds N. Am. 1858, 374, pl. xxxiii, fig. 4.—MAX. Cab. Jour. VI, 1858, 106.

Sitta melanocephala, VIEILL. Gal. I, 1834, 171, pl. clxxi.

Other figures: WILSON, Am. Orn. I, pl. ii, fig. 3.—AUD. Orn. Biog. II, pl. 152.—Ia. B. A. IV, pl. 247.

Hab. United States and the Provinces; west to valley of the Missouri.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
28,934	..	..	Nova Scotia.	...	W. G. Winton.	.....
1,645	..	..	Carlisle, Pa.	July 11, '44.	S. F. Baird.	.....
1,761	...	♀	"	Jan. 1845.	"	.....
28,954	1,004	..	Washington, D. C.	Oct. 13, '60.	E. Coues.	.....
29,952	602	♀	"	Oct. 14, '61.	D. W. Prentiss.	.....
30,996	115	♂	"	Oct. 23, '62.	C. E. Schmidt.	.....
29,735	..	♀	Peoria, Ill.	...	Bishop.	.....
8,337	62	♂.	Independence, Mo.	June 6, '37.	W. M. Magraw.	Dr. J. G. Cooper.
6,302	17	..	Fort Leavenworth.	Dec. 24, '54.	Lt. Couch.	.....
5,871	28	♂	East of Fort Riley.	June 19, '56	Lt. Bryan. [mond.	W. S. Wood.
5,871	..	..	Fort Riley, Kans.	...	Dr. W. A. Ham-	.....

(1,645) 6.08; 10.89; 3.68. (1,761.) 6.00; 11.25; 3.75. (28,954.) 5.90; 11.10; 3.40. (29,252.) 6.80; 10.90; 3.80. (30,996.) 6.00; 11.00.

Sitta aculeata.

Sitta aculeata, CASSIN, Pr. A. N. Sc. VIII, Oct. 1856, 254.—BAIRD, Birds N. Am. 1858, 375, pl. xxxiii, fig. 3.

? *Sitta carolinensis*, SCLATER, P. Z. S. 1856, 293 (Cordova); 1858, 300 (Oaxaca); 1859, 363 (Xalapa), 373 (Oaxaca).

Hab. Western and Middle United States, south to Cordova, Mex.

As remarked in Birds N. Am., the only appreciable difference between this species and the preceding is in the much slenderer bill. The Mexican White-bellied Nuthatches seem to belong here rather than to the *carolinensis;* at least the specimens I have seen do so. It is very difficult to express this difference appreciably; but a comparison of large series from the two localities will readily illustrate the fact as will the figures cited in B. N. A.

Mr. Sclater calls attention to the inferiority of size of his specimens from Oaxaca; this might be anticipated from their southern locality as resident birds.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,948	590	♂	Colville, W. T.	Mar. 1860.	A. Campbell.	George Gibbs.
21,949	601	..	Moogie R., W. T.	Aug. 1860.	"	Dr. Kennerly.
21,950	604	♀	Kootenay R., W. T.	"	"	"
6,811	258	..	Ft. Steilacoom, W.T.	...	Dr. Suckley.	.....
16,185	274	♂	Fort Crook, Cal.	...	Jno. Feilner.	.....
22,083	80	..	"	...	D. F. Parkinson.	.....
5,502	280	..	Petaluma, Cal.	...	E. Samuels.	.....
6,806	..	..	San Francisco, Cal.	...	R. D. Cutts.	.....
4,944	..	..	San Jose, Cal.	...	A. J. Grayson.	.....
25,328	113	♂	Fort Tejon, Cal.	June, 1857.	J. Xantus.	.....
29,747	1,161	..	Auburn, Cal. [Idah.	Dec. 1, '62.	Ferd. Gruber.	.....
18,423	12	..	W. of Fort Benton,	April, 1860.	Lt. Mullan.	Hildreth.
17,548	618	♀	Bitterroot Valley.	..	"	J. Pearsall.
11,081	..	♂	Fort Bridger, Utah.	May 30.	C. Drexler.	.....
19,228	166	♂	Sheyenne River.	Oct. 29.	Capt. Raynolds.	Dr. Hayden.
11,731	..	..	Cantonment Burgwyn, N. M. [Ariz.	...	Dr. Anderson.	.....
12,102	..	♂	San Francisco Mts.,	Oct. 14, '52.	Capt. Sitgreaves.	Dr. Woodhouse.
6,807	26	..	100 miles west of Albuquerque.	...	Lt. Whipple.	Dr. Kennerly.
13,673?	..	..	Xalapa, Mex.	...	P. L. Sclater.	R. M. D'Oca.
13,589	..	..	Mexico.	...	J. Gould.	.....

Sitta canadensis.

Sitta canadensis, LINN. Syst. Nat. I, 1766, 177.—AUD. Orn. Biog. II, 1834, pl. 108.—IB. Birds Am. IV, pl. 248.—REICH. Handb. Abt. II, 1853, 152, tab. dxiii, figs. 3,561-2.—BAIRD, Birds N. Am. 1858, 376.—SCLATER, Catal. 1861, 15, no. 91.

Sitta varia, WILS. Am. Orn. I, 1808, 40, pl. ii.

Hab. Whole United States and British Provinces.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,873	..	..	East Bethel, Vt.	...	C. S. Paine.	.....
818	..	♂	Carlisle, Pa.	Oct. 19, '42.	S. F. Baird.	.....
28,409	..	..	Washington, D. C.	...	C. Drexler.	.....
13,190	..	♂	Upper Georgia.	...	A. Gerhardt.	.....
11,608	..	..	Riceboro', Ga.	...	Prof. Leconte.	.....
6,937	11	..	Selkirk Settlement.	...	Donald Gunn.	.....
17,543	609	♀	Bitterroot Valley, Rocky Mts.	...	Lt. Mullan.	J. Pearsall.
18,424	..	..	W. of Fort Benton.	Feb. 6, '60.	"	Hildreth.
11,078	..	♂	Fort Bridger.	May 19, '58.	C. Drexler.	.....
8,840	..	..	Black Hills.	Sept. 30.	Lt. Warren.	Dr. Hayden.
5,280	..	♂	Cedar Island, Mo.	...	"	"
21,951	..	..	Kootenay R., W. T.	April, 1860.	A. Campbell.	George Gibbs.
22,046	49	..	Rocky Mountains.	Aug. 15, '60.	Dr. J. G. Cooper.	.....
16,190	273	..	Fort Crook, Cal.	...	Jno. Feilner.	.....
6,838	..	..	Sacramento Valley.	...	Lt. Williamson.	Dr. Heermann.
11,538	..	..	Fort Yuma, Cal.	...	Lt. Ives.	Möllhausen.

Sitta pusilla.

Sitta pusilla, LATH. Ind. Orn. I, 1790, 263.—WILS. Am. Orn. II, 1810, 105, pl. XV.—AUD. Orn. Biog. II, 1834, pl. 125.—IB. Birds Am. IV, pl. 249.—REICH. Handb. 1853, 153, tab. dxiv, figs. 3,567–8.—BAIRD, Birds N. Am. 1858, 377.—SCLATER, Catal. 1861, 15.

Hab. South Atlantic—and Gulf States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
3,086	..	♀	Liberty Co., Ga.	1846.	S. F. Baird.	W. L. Jones.
2,399	..	..	Savannah, Ga.	1845.	"	Jos. Leconte.

Sitta pygmæa.

Sitta pygmæa, VIGORS, Zool. Beechey's Voy. 1839, 25, pl. iv.—AUD. Orn. Biog. V, 1839, pl. 415.—IB. Birds Am. IV, pl. 250.—REICH. Handb. 1853, 153, tab. dxiv, figs. 3,365–6.—NEWBERRY, P. R. R. Rep. VI, IV, 1857, 79.—BAIRD, Birds N. Am. 1858, 378.—SCLATER, P. Z. S. 1859, 363 (Xalapa).—IB Catal. 1861, 15, no. 93.

Hab. Western and Middle United States; south to Xalapa.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,840	..	..	Washington Terri-	Oct. 1853.	Gov. I. I. Stevens.	Dr. J. G. Cooper.
21,953	884	..	Kootenay Riv.[tory.	Mar. 20, '60.	A. Campbell.	Geo. Gibbs.
22,047	82	..	Bitterroot Valley.	...	Dr. J. G. Cooper.	.....
16,192	199	♂	Fort Crook, Cal.	...	Jno. Feilner.	.....
21,448	..	..	"	...	D. F. Parkinson.	.....
3,729	..	..	? Monterey, Cal.[Ar.	...	W. Hutton.	.....
6,803	43	..	San Francisco Mts.,	Dec. 27, '53.	Lt. Whipple.	Dr. Kennerly.
11,730	..	..	Cantonment Bur- [gwyn, N. M.	...	Dr. W. W. Ander- [son.	.....

FAMILY CERTHIADÆ.[1]

CERTHIA, LINNÆUS.

Certhia, LINNÆUS, Syst. Nat. ed. 10th, 1758, 112. (Type *C. familiaris.*)
(See REICHENBACH, Handbuch, I, II, 1853, 256, for a monograph of the genus.)

Plumage soft and loose. Bill as long as head, not notched, compressed; all its lateral outlines decurved. Nostrils not overhung by feathers, linear, with an incumbent thickened scale, as in *Troglodytes*. No rictal bristles, and the loral and frontal feathers smooth, without bristly shafts. Tarsus scutellate anteriorly, shorter than middle toe, which again is shorter than hind toe. All claws very long, much curved and compressed; outer lateral toe much the longer; basal joint of middle toe entirely adherent to adjacent ones. Wings rather pointed, about equal to the tail, the feathers of which are much pointed with stiffened shafts. Primaries ten; 1st less than half the 2d.

Of the *Certhiadæ* but one genus belongs to America—*Certhia*, with its two recognized species. The characters above given include both family and generic characters, derived from this one genus. This is readily distinguished by the decurved, compressed bill; absence of notch and bristles; exposed linear nostrils with incumbent scales; connate middle toe, very long claws, short tarsi, pointed and stiffened tail feathers, etc.

Certhia americana.

Certhia familiaris, VIEILL. Ois. Am. Sept. II, 1807, 70 (not the European bird?); also of WILSON and AUDUBON.

Certhia americana, BONAP. Comp. List, 1838.—REICH. Handb. I, 1853, 265, pl. dcxv, figs. 4,102–3.—BAIRD, Birds N. Am. 1858, 372.—MAX. Cab. Jour. 1858, 105.—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 1859, 192.—SCLATER, Catal. 1861, 15, no. 94.

With much additional material to that used in preparing the article on this species in the Birds N. Am., I find it still difficult to make the specimens from western America different from eastern. The bill is perhaps longer on an average, although single eastern specimens may be found exhibiting the maximum condition in this respect. The white of under parts appears purer, the light line over the eye

[1] See Reichenbach, Handbuch der Orn. I, II, 1853.

more distinct; the colors above possibly a little darker, with more reddish.

The series at my command of the European *C. familiaris* is not sufficiently large nor perfect enough to permit any very satisfactory comparisons. The bill, however, appears longer and higher than in eastern *C. americana*. The claws are longer, and the tail shorter, not equalling the wings instead of exceeding them. The first quill is longer, its exposed portion being half that of the second, instead of considerably less. The coloration is exceedingly similar; the central light streaks of the feathers above are, however, less distinct, being not so white, and more pervaded by the ferruginous. The under parts are more ashy, and the rusty of the crissum perhaps less prominent.

Certhia costæ is, in reality, more nearly related than *C. familiaris* to our species in color and length of tail. This differs again in still larger bill and claws, and in a purer white of the under parts. The three, however, are so very closely related as almost to be entitled to consideration as races of one species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
827	..	♂	Carlisle, Pa.	Oct. 22, '42.	S. F. Baird.	.....
1,337	..	♀	"	April 5, '44.	"	.....
29,946	729	♂	Washington, D. C.	April 24, '60.	E. Coues.	.....
29,947	109	♀	"	Dec. 25, '59.	D. W. Prentiss.	.....
32,293	..	♂	Liberty Co., Ga.	...	Jos. Leconte.	.....
11,587	..	..	Red River Settlem't.	April 9.	D. Gunn.	.....
29,920	..	..	Illinois [Sound.	...	R. Kennicott.	.....
17,430	461	♂	Simiahmoo, Puget	Jan. 1860.	A. Campbell.	Dr. Kennerly.
7,155	..	..	Ft Steilacoom, "	...	Dr Suckley.	.....
14,174	174	♂	Fort Crook, Cal.	...	John Feilner.	.....
22,060	67	..	"	...	D. F Parkinson.	.....
12,323	..	♂	Fort Tejon, Cal.	...	J. Xantus.	.....
13,743	144	♂	" [gwyn, N. M.	...	" [son.	.....
11,314	..	♀	Cantonment Bur-	...	Dr. W. W. Ander-	.....
7,154	47	..	Pueblo Creek, N. M.	Jan. 22, '54.	Lt. Whipple.	Dr. Kennerly.

(827.) 5.40; 7.80; 2.60. (1,337.) 5.00; 7.60; 2.50. (25,946.) 5.30; 8.00; 2.50. (29,947.) 5.00; 7.20; 2.30 (32,293.) 5.50; 7.80; 2.70.

Certhia mexicana.

Certhia mexicana, "Gloger, Handbuch," Reichenbach, Handbuch, I, 1853, 265, pl. dlxii, figs. 3,841-2.—Sclater, P. Z. S. 1856, 290; 1858, 297; 1859, 362, 372.—Ib. Catal. 1861, 15, no. 95.—Baird, Birds N. Am. 1858, 373 (under *C. americana*), pl. lxxxiii, fig. 2.

Hab. Mexico; perhaps extending along the table lands into the U. States.

This species will be readily recognized on comparison with the United States species by its much darker color above, and especially the deeper shade of brown on the rump, and apparently its greater

extension up the back. The throat alone is white; the remaining under parts, the flanks especially, having an ashy brown tinge, not noticed in the other species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
8,176	..	..	Mexico.	...	J. Gould.	.....
13,688	..	..	"	...	"	.....

Family TROGLODYTIDÆ.

Rictal bristles wanting; the loral feathers with bristly points; the frontal feathers generally not reaching to nostrils. Nostrils varied, exposed or not covered by feathers, and generally overhung by a scale-like membrane. Bill usually without notch. Wings much rounded, about equal to tail, which is graduated. Primaries ten, the first generally about half the second. Basal joint of middle toe usually united to half the basal joint of inner, and the whole of that of the outer, or more. Lateral toes about equal, or the outer a little the longer. Tarsi scutellate.

The impossibility of defining any large group of animals, so as to separate it stringently and abruptly from all others, is well understood among naturalists; and the *Troglodytidæ* form no exception to the rule. Some bear so close a resemblance to the Mocking Thrushes as to have been combined with them; while others again exhibit a close approximation to other subfamilies.[1]

[1] The genus *Rhodinocichla* has, by most of our systematic writers, been placed among the *Dendrocolaptidæ*, and thus as not belonging to the Oscines at all. Taking all this for granted, I deferred any investigation of the species until I had finished the Oscines. A casual examination has, however, recently convinced me that the genus is truly Oscine, and possibly one of the *Troglodytidæ*. Dr. Sclater coincides in this view, and is inclined to place it very near *Heleodytes*. As it is now too late to introduce it in its proper place, I defer further consideration of the subject to the Appendix, and merely give the principal synonyms:—

Rhodinocichla rosea.

Furnarius roseus, Lesson, Ill. Zool. pl. v.—*Rhodinocichla rosea*, Hartl. Cab. Jour. 1853, 33.—Scl. Pr. 1855, 141; 1846, 140.—Ib. Catal.

The structure of the feet, however, as far as my observations extend, furnishes a good character for limiting the family, and especially of distinguishing it from the *Turdidæ*. In the latter the basal joint of the outer lateral toe is united to the middle toe; sometimes only a part of it and the inner toe is cleft almost to its very base, so as to be opposable to the hind toe, separate from the others. In the *Troglodytidæ*, on the contrary, the inner toe is united by half its basal joint to the middle toe; sometimes by the whole of this joint, and the second joint of the outer toe enters wholly or partially into this union, instead of the basal only. In addition to this character, the open exposed nostrils, the usually lengthened bill, the generally equal lateral toes, the short rounded wings, the graduated tail, etc., furnish points of distinction. In the skins before me there appear to be considerable differences in the structure and appearance of the nostrils, which may serve to aid in defining the genera with considerable precision. The exact characters, of course, cannot be very readily ascertained from dried specimens, and I may have erred in the interpretation of the appearances presented; although a careful examination of a large number of representatives of the species has been made. All the forms agree pretty well in the character of the wings and tail, which differ in relative size and in shape less than in most families; the feet are quite similar, and the bills only moderately varied; so that, without an examination of the nostrils, it would be difficult to establish intelligibly some of the genera.

In general there is a thin, vertical, imperforate septum in the median plane of the nose, separating the nasal cavities of opposite sides. Some skins of *Campylorhynchus* exhibit an aperture in this septum, but I am unable to satisfy myself that this has not been caused artificially by passing a string through the nostrils to fasten the two jaws together. Besides this, however, there is what may be called the lateral septum (a modification of the turbinated bones of the nose) on either side of the median, which either projects a short distance into the posterior portion of the nasal cavity, with a nearly vertical edge (seen in *Thryothorus*), or is continued along

1861, 147, no. 891.—LAWRENCE, Ann. N. Y. Lyc. VII, 292.—CAB. & HEIN. M. H. II, 1859, 23.

Turdus vulpinus, HARTL. R. Zool. 1849, 276.—IB. P. Z. S. 1850, 276, plate.

Originally described from Venezuela and Caraccas, Mr. Lawrence has received it from the line of the Panama R. R., while the Smithsonian Institution possesses specimens from Colima and Mazatlan. A note by Col. Grayson, attached to a Mazatlan skin, states that it is one of the sweetest singers of that vicinity, fully equal in this respect to any species of Thrush.

the roof of the cavity to its upper anterior extremity, constantly diminishing in depth (as in *Thryophilus*), or is carried still further round to the lower anterior end, as in *Salpinctes*, where it is arched outwards so as to be parallel with the external scale. This septum is not noticeable in the specimen of *Heleodytes* before me; in all others where the nostrils are sufficiently open it is quite appreciable. This lateral septum is sometimes vertical or parallel to the median septum; in *Cinnicerthia*, however, it is slightly revolute, showing a free edge perpendicular to the median plane, which forms a low wall dividing the oval nasal cavity into two parts, but not coming to the surface. In *Heterorhina* this wall is higher, reaching the level of the nostrils, but not adherent to the edges; while in *Microcerculus*, if the indications of the poor specimens of *M. bambla* before me are not misinterpreted, this septum is united to the edges, forming a bridge separating two cavities.

In most forms of *Troglodytidæ* the nostrils occupy the lower side of the nasal groove, and are more or less elongated, and overhung by a valvular convex or vaulted projection of the nasal membrane, which is thickened and rounded at the edges. This varies in development, least in *Campylorhynchus*, more distinct in *Thryothorus*; while in *Pheugopedius*, it seems almost to close the aperture. In *Thryophilus*, however, this scale-like projection appears to be entirely wanting, leaving the nasal cavity broadly open, and the lateral cavity much exposed. In *Heleodytes*, and in some forms of *Campylorhynchus*, the nasal aperture, as in *Donacobius*, has its anterior half resting in the end of the nasal groove, bordered only behind and by thin membrane only, and with no lateral septum visible. In *Cyphorinus*, the nostril is small, circular, and entirely surrounded by membrane. In the others, it rests against the lower side of the nasal groove at its anterior extremity, with membrane above and behind it only.

The bill, in most species, is long, slender, subulate, and decurved; in *Cinnicerthia*, it is more conical. It is generally without notch at the end, except in *Cyphorinus*, *Microcerculus*, *Heterorhina*, and *Thryophilus*. The feathers of the forehead do not come as far forward as the nostrils, as a general rule.

The lateral toes are about equal, the outer very little the longer; in *Salpinctes* and *Catherpes*, however, the discrepancy is very marked. In *Heleodytes* the tarsus is as short as the middle toe, or shorter; in all others it is longer, generally considerably so. The legs are very stout in *Heleodytes*, *Campylorhynchus*, and *Cinnicerthia*; in the others they are more slender.

Contrary to the opinions of most Ornithologists, I have placed the genus *Donacobius* among the Thrushes, rather than the Wrens: the reasons for this are given on page 58.

With these preliminary general remarks, I proceed to present a brief synopsis of the genera and subgenera of American *Troglodytidæ*, which, however artificial, may serve to aid in their determination. The fuller characters will be found detailed under each genus:—

A. Nostrils broadly oval, not overhung; anterior half resting in the end of the nasal groove; no lateral septum visible. Bill not notched. Tarsi as short as midde toe and claw. Legs stout . . . . . *Heleodytes.*

B. Nostrils quite broadly oval, without distinct lateral septum, this being concealed by the narrow scale which margins the nostril above. Bill not notched. Legs stout; claws strong, much curved; tarsus longer than middle toe and claw. Tail about equal to wings . . *Campylorhynchus.*

C. Bill slender, not notched. Nostrils elongated, in lower side of nasal groove, overhung by an arched portion of nasal membrane, thickened, with rounded edges. Inner lateral toe considerably shorter than outer.

  a. Inner lateral toe equal to hind toe. Lateral plates along posterior half of tarsi divided into smaller ones . . . . . *Salpinctes.*

  b. Inner lateral toe considerably shorter than hind toe. Plates of posterior half of tarsus continuous, or not divided into smaller ones . . . *Catherpes.*

D. Nostrils broadly oval, divided by a low wall perpendicular to the median nasal septum, but not coming to the surface; bordered above by scarcely thickened membrane, placed in end of nasal groove. Legs very stout. Bill short, broad at base, without notch. Culmen much curved. Tail much graduated, about equal to the wings . . . . . *Cinnicerthia.*

E. Bill distinctly notched at end (not notched in any other *Troglodytidæ*).

  a. Bill distinctly notched, very high, and much compressed. Nostrils small, truly circular, opening in the middle of the nasal membrane. Tail much shorter than (about two-thirds) the wings . . *Cyphorinus.*

  b. Bill distinctly notched, quite high and compressed. Nostrils apparently double, the single aperture being divided by a bridge. Tail scarcely more than half the wings . . . . . *Microcerculus.*

  c. Bill faintly notched, scarcely higher than broad at the base. Nostrils broadly oval, with membrane above, but no thickened scale; divided by a septum coming to the surface, which, however,

does not form a bridge. Tail about two-thirds the wings . . . . . *Heterorhina.*

d. Nostrils broadly open, and exposed; not overhung by a scale, and showing a lateral vertical septum extended forwards above; anterior half in the end of nasal groove. Bill distinctly notched. Tarsi longer than middle toe and claw. Tail about equal to the wings . . . . . *Thryophilus.*

F. Bill not notched, slender, or very deep. Nostrils linear, on lower edge of nasal groove, and overhung, sometimes concealed, by an arched or vaulted thickened membrane with rounded edges. Lateral toes about equal.

a. Bill very stout and deep, as long as the head; height about one-third the length above. Wings about equal to the tail . . . . . *Pheugopedius.*

b. Bill slender. Tail about equal to the wings, or, if shorter, only moderately graduated (outer at least four-fifths of central). Hind claw shorter than the rest of the toe. A lateral nasal septum, vertical and projecting into the posterior portion of the nasal cavity.

1. Bill as long as the head. Tail feathers broad, about as long as the wings.
   Tail equal to the wings . . . . *Thryothorus.*
   Tail longer than the wings . . . *Thryomanes.*
2. Bill shorter than the head. Tail feathers narrow. Colors plain.
   Tail equal to the wings . . . . *Hylemathrous.*
   Tail shorter than the wings . . . *Troglodytes.*

c. Bill slender. Tail shorter than the wings, very much graduated. Lateral feathers about two-thirds the central. Hind claw as long as rest of toe.

1. Bill as long as the head. Hind claw longer than rest of toe . . . . . *Telmatodytes.*
2. Bill shorter than the head. Hind claw equal to the rest of the toe . . . . *Cistothorus.*

HELEODYTES, Cabanis.

Heleodytes, Cab. Mus. Hein. I, 1850, 80. (Type *Furnarius griseus*, Sw.)

Bill longer than head, without notch or rictal bristles. Nostrils broadly oval, in the anterior extremity of nasal groove, bordered behind by a naked membrane as in *Donacobius*. Commissure curved gently, not angulated; gonys straight. Wings about length of tail. First primary considerably more than half the longest; second longer than secondaries. Tail moderately graduated; outer feather about five-sixths the middle; outer web of exterior feather about one-third the inner. Tarsi scarcely longer than the middle toe. Colors plain, without dark spots or bars.

Although the genus *Heleodytes* is not represented within the region covered by the present review, I introduce a brief mention of it with the view of completing the history of the family, as well as of illustrating the peculiarities of the species of *Campylorhynchi* having very similar nostrils. The relationships between the two genera are very close, and it is almost a question whether they can be separated trenchantly from each other. The specimen before me, from Mr. Lawrence's collection, is from Bogota; and, as it may be different from the species of Guiana and Venezuela, I subjoin a brief description.[1]

CAMPYLORHYNCHUS, SPIX.

Campylorhynchus, SPIX, Av. Bras. I, 1824, 77. (Type *C. scolopaceus*, SPIX = *Turdus variegatus*, GMEL.)

Bill stout, compressed, as long as, or longer than the head, without notch or rictal bristles; culmen and commissure curved; gonys nearly straight. Nostrils in the antero-inferior part of nasal groove, in advance of the frontal feathers, with an overhanging scale with thickened edge, as in *Thryothorus;* sometimes, as in the type, reduced to a slight ridge along the upper side of the nasal groove. Lateral septum not projecting below or anteriorly into the nasal cavity, but concealed by the nasal scale. Tarsus a little longer than middle toe and claw; claws strong, much curved, and very sharp; middle toe with basal joint adherent almost throughout. Wings and tail about equal, the latter graduated; the exterior webs of lateral feathers broad. In size the largest of the family.

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[1] **Heleodytes griseus.**

Furnarius griseus, SWAINSON, Anim. in Menag. 1838, 325 (2¼ Centen. No. 134), fig. 67, *b* (bill), Guiana.—*Campylorhynchus griseus*, CAB. Schomburgk, Reise Guiana, III, 1848, 674.—*Heleodytes griseus*, CAB. Mus. Hein. 1850, 80.—SCLATER, Catal. 1861, 16, no. 97.

Whole upper parts, including wings and tail, plain brown, without bars or other markings, as also a line from behind the eye; the nape and interscapulum blackish-brown, the top of head lighter, the lower back and rump reddish-brown. Entire under parts, including lining of wings, tibia, and a broad line from bill over the eye, soiled white. All the tail feathers, except the two central, with a broad subterminal bar of white, diminishing in width from the outer feathers to the inner, but at the same distance from the tips.

Total length, 8.50; wing, 3.30; tail, 3.45; graduation, .45; exposed portion of 1st primary, 1.35, of 2d, 2.15, of longest, fourth (measured from exposed base of 1st primary), 2.45; length of bill from forehead, 1.16, from nostril, .66; along gape, 1.26; tarsus, 1.10; middle toe and claw, 1.10; claw alone, .30; hind toe and claw, .87; claw alone, .38.

There are some points of difference in different groups of *Campylorhynchus* in the character of the nostrils and some other features. In the type, as remarked, the nasal scale is reduced to a mere ridge on the upper side of the nasal groove—the cavity being oval. In *jocosus* it is similar, with the cavity more linear. In *megalopterus, ornatus, brunneicapillus*, and their allies, the scale is more developed, as in tropical Wrens. In *C. capistratus, rufinucha, humilis*, etc., the nostril is more like *Donacobius* and *Heleodytes*, namely, at the anterior end of the nasal groove, bordered behind by membrane, and not above. In these the tail is shorter and less graduated than in the type. *C. capistratus* is placed by Cabanis under *Heleodytes*, on account of its peculiarities of nostril; it differs, however, in shorter tail, shorter bill, weaker legs, and the middle toe shorter than the tarsus, not longer.

The following table exhibits the peculiarities of the species before me in reference to the nostrils:—

A. Nostrils rather linear, horizontal, in lower side of nasal groove, and overhung broadly by membrane thickened at edges: *C. brunneicapillus, affinis, pallescens, balteatus, megalopterus, zonatus, pardus.*

B. Nostrils more oval, the overhanging membrane reduced to a ridge on upper edge of nasal groove: *C. variegatus, brevirostris, zonatoides, jocosus* (nostrils more linear), *albibrunneus.*

C. Nostrils as in *Heleodytes;* broadly oval or rounded, in anterior end of nasal groove, with thin membrane behind: *C. capistratus, rufinucha, humilis.*

The transition, however, from one to another form, is very gradual, and it is quite difficult to say, in regard to some species, whether they belong more properly to one section or to another. Without more specimens therefore at my command, I prefer to consider all as identical generically.

The following synopsis may aid in determining the Middle American species, and their nearest S. American allies, by their colors:—

A. Upper parts uniformly brown, without bands or spots. Head and neck with whole under parts white . . . *C. albibrunneus.*

B. Top of head and post-ocular stripe reddish-brown; back streaked longitudinally and linearly with white. All the feathers beneath conspicuously spotted. Crissum and flanks with rounded or elongated spots. Nostrils inferior, linear, overhung by a scale.

a. Spots much larger on throat and jugulum than elsewhere. Inner webs of 2d–5th tail feathers (between middle and outer feathers) black, except at tips . . . . . *brunneicapillus.*

b. Spots on throat and jugulum little larger than elsewhere. Inner webs of intermediate tail feathers banded with white like the outer . . . . . *affinis.*

C. *Top of* head nearly uniform yellowish-gray. Upper parts and all the tail feathers banded transversely with brownish-black and whitish. Rounded black spots on the throat and breast.

a. Body beneath reddish-brown posteriorly, with sparse rounded spots on belly and crissum: geminate rounded spots on flanks . . . . . *zonatus.*

b. Body grayish-white beneath, and conspicuously banded transversely everywhere posteriorly.

Wings longer than the tail . . . . . *pallescens.*

Wings shorter, or not longer than the tail . . *balteatus.*

D. Top of head with well defined streaks of whitish and brown; otherwise much as in two last species . . *megalopterus.*

E. Top of head and post-ocular stripe blackish. Tail feathers, except the central, black, terminated broadly by soiled white.

a. Nape rufous.

Interscapulum unicolor. Beneath entirely unspotted (or unicolor), as are also the outer webs of the intermediate tail feathers . . . . . *capistratus.*

Interscapular feathers banded with black spots, separated by whitish streaks. Crissum banded. Outer webs of intermediate tail feathers banded with whitish . . . . . *rufinucha.*

b. Nape streaked black and white, not rufous.

Beneath with conspicuous rounded black spots. Crissum banded. Tail tipped with soiled white . *jocosus.*

Beneath plain whitish, immaculate. Tail without white tips . . . . . *nigriceps.*

F. Top of head reddish-brown. Back with geminate black spots, not with linear streaks. Bill very short. Nostrils anterior, rounded, in end of nasal groove.

a. Post-ocular stripe reddish-brown. Beneath unspotted. Crissum banded. Exterior lateral tail feather alone spotted on both webs . . . *humilis.*

b. Post-ocular stripe black? Beneath with rounded black spots. Two outer tail feathers spotted on both webs . . . . . *gularis.*

Campylorhynchus albibrunneus.

Heleodytes albobrunneus, LAWR. Ibis, IV, Jan. 1862, 10.—IB. Ann. N. Y. Lyc. VII, 1862, no. 322 (Isthmus of Panama).

Not figured.

Hab. Line of Panama Railroad.

Head and neck all round and under parts, including lining of wings, pure white; rest of upper parts, with wings and tail, uniform liver brown. The

feathers of crissum are tinged with rusty, and with a central brownish streak. Bill horn-color, lighter along the commissure and beneath. Legs light-brown.

Total length, 7.60; wing, 3.50; tail, 3.60; graduation, .82; exposed portion of 1st primary, 1.32, of 2d, 2.20, of longest, 4th (measured from exposed base of 1st primary), 2.60; length of bill from forehead, 1.00, from nostril, 1.65; along gape, 1.10; tarsus, 1.00; middle toe and claw, .85; claw alone, .23; hind toe and claw, .74; claw alone, .35.

This species is quite closely allied to *C. unicolor*, of Lafresnaye, which is pretty uniformly brown above, dirty white beneath, with a few brownish spots on the crissum.

There is very little in the species to distinguish it generically from the type of *Campylorhynchus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,832	..	..	Frijole, P. R. R.	...	J M'Leannan.	.....
..	74	♂	Panama R. R.	...	Cab. Lawrence.	.....

(74.) Type.

Campylorhynchus brunneicapillus.

Picolaptes brunneicapillus, LAFRESNAYE, Mag. de Zool. 1835, 61, pl. xlvii. —LAWR. Ann. N. Y. Lyc. V, 1851, 114.—CASSIN, Birds Cal. Tex. 1854, 156, pl. XXV.—HEERMANN, J. A. N. Sc. II, 1853, 263.—*C. brunneicapillus*, GRAY, Genera, I, 1847, 159.—BP. Consp. 1850, 223. —SCL. P. A. N. S. 156, 264.—BAIRD, Birds N. Am. 1858, 355.—HEERMANN, P. R. R. X, 1859, Williamson's Report Birds, 41 (nesting). (E. of Tejon Pass, etc.)

Hab. Adjacent borders of the United States and Mexico, from mouth of Rio Grande to the valley of the Colorado; San Diego. Replaced at Cape St. Lucas by *C. affinis*.

I find it quite impossible to reconcile Lafresnaye's description of *C. brunneicapillus*, much less his figure with the North American bird. This is described as having five white spots on the outer web of the lateral tail feather, and three on the inner; the next with two on the outer and three on the inner web (perhaps three outer and two inner); the third and fourth with marginal points instead of spots.

This particular pattern of coloration I have not observed in any specimens of our bird, and the spots are larger than as described, although the markings of the tail vary a good deal. Lafresnaye, however, describes the under parts as pale rufous from the upper part of the breast to the tail (represented also in the plate), instead of having this rufous confined to the abdominal region. The speci-

men described is said to have probably come from California, though possibly from Peru.

I do not feel warranted in changing Lafresnaye's name, though it will not be at all surprising to find that he had quite a different species from the North American bird before him. It may be that Gould's species *guttatus* belongs more particularly to the latter.

Smithsonian No.	Coll. No.	Sex and Age.	Locality.	When Collected.	Received from.	Collected by.
7,148	..	..	Ringgold Barracks, Tex.	...	Major Emory.	J. H. Clark.
3,966	173	♂	Monterey, Mex.	April, 1853.	Lt. Couch.	.....
7,149	..	♂	California.	...	Lt. Williamson.	Dr. Heermanns.
7,150	..	♀	Los Angeles.	...	"	"
31,394	774	♂	San Diego.	Mar 2, '62.	Prof. Whitney.	Dr. Cooper.

(3,966.) Eyes reddish-yellow. 9.00; 10.75; 3.50. (31,394.) 9.00; 11.50; 3.75. Iris blood-red.

Campylorhynchus affinis.

Campylorhynchus affinis, XANTUS, Pr. A. N. Sc. 1859, 298 (Cape St. Lucas).—BAIRD, Pr. A. N. Sc. 1859, 303.—SCL. Catal. 1861, 17, no. 108.

Not figured.

Hab. Only observed at Cape St. Lucas, Lower California.

Cap of head reddish-brown; the concealed centres of feathers dusky. Rest of upper parts grayish-brown, all the feathers of body and scapulars with broad central or shaft streaks of whitish edged with black; the streaks irregular in outline, on some feathers nearly linear, in others widening at intervals along the shaft. Outer webs of the wing feathers crossed by about seven rows of whitish semicircular spots, with corresponding series of more circular ones on the inner web. Tail feathers black, all of them with a series of about eight quadrate white spots on each web, which are alternate to each other, not opposite, and extend from or near the black shaft to the edge; the extreme tips of the feathers black; the two central feathers, however, more like the back, with irregular mottling of grayish and black. Upper tail coverts barred transversely with black.

Under parts white, faintly tinged with rusty posteriorly; each feather spotted with black, excepting on the immaculate chin. These spots are rather larger and more quadrate on the jugulum, where they are sometimes on the sides of the feathers (on one or both sides); posteriorly, however, they are elongated or tear-shaped, and strung along the shaft, one or two on each. On the crissum they are large and much rounded, three or four on each longer feather. Legs rather dusky. Bill lead color, pale at the base below; "iris reddish-brown." A broad white stripe from bill over the eye and nape, edged above and below with black; line behind the eye like the crown; cheek feathers white, edged with blackish.

Immature specimens exhibit a tendency to a whitish spotting in the ends of the feathers of the cap. A very young bird does not, however, differ ma-

terially, except in having the spots less distinct beneath; the white streaks less conspicuous above; the white of the wings soiled with rufous. Specimens vary considerably in the proportional as well as absolute thickness and length of the bill; thus, No. 32,167 measures .80 from nostril to end of bill, instead of .60, as given below for No. 12,965.

12,965. Total length, 7.50; wing, 3.30; tail, 3.40, its graduation .45; exposed portion of 1st primary, 1.42, of 2d, 2.15, of longest, or 4th (measured from exposed base of 1st primary), 2.45; length of bill from forehead, .90, from nostril, .60; along gape, 1.07; tarsus, 1.02; middle toe and claw, .90; claw alone, .25; hind toe and claw, .76; claw alone, .35.

This species is most nearly allied to *C. brunneicapillus;* the most apparent difference at first sight being in the greater concentration of black on the throat and jugulum in *brunneicapillus*, and the much smaller size of the remaining spots on the under parts, with the decided light cinnamon of the posterior portion of the body. The outer and central tail feathers alone are marked as in *C. affinis*, the intermediate ones being entirely black, with the exception of a white subterminal band.

This is one of the most characteristic birds constituting the isolated Fauna of Cape St. Lucas. Like nearly all the species peculiar to this remarkable locality, it is exceedingly abundant, breeding in immense numbers. It has not yet been detected elsewhere, though it may possibly be found on the lower Colorado.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,961	632	♂	Cape St. Lucas.	...	J. Xantus.	.....
12,965	190	♂	"	...	"	.....
12,963	656	♀	"	...	"	.....
16,959	1,463	Juv.	"	...	"	.....
32,166	4,988	♂	"	April 25,'60.	"	.....
32,167	..	♂	"	1861.	"	.....

(12,963.) Iris reddish-brown.

Campylorhynchus pallescens.

Campylorhynchus pallescens, LAFRESNAYE, Rev. Zool. 1846, 93 (Mexico); not of SCLATER (=*C. balteatus*).

Campylorhynchus megalopterus, SCLATER, P. Z. S. 1858, 298 (Oaxaca); 1859, 363 (Xalapa); 371 (Oaxaca).—IB. Catal. 1861, 17, no. 105; not of Pr. A. N. Sc. Phila. 1856, 264 (which is true *megalopterus*).

Hab. Southern Mexico.

(No. 13,659.) Body varied with brown and soiled white; no reddish. Top of head brownish-ash, showing more or less the pure brown centres of the feathers; nape streaked with black and white; rest of upper parts banded transversely with soiled white and blackish in about thirteen or fourteen

nearly equal zones of each color from nape to end of tail coverts; more obscure posteriorly, and the white changing rather to light brownish-ash. Wings blackish, with about five series of brownish-white spots extending over outer webs; quills edged internally (not spotted) with the same. Tail feathers black, with about seven transverse light bands, narrower than their interspaces; whitish on the outer webs and edges of the inner; sometimes obscured and irregular medially; most distinctly transverse on the lateral feathers, and most obsolete on the inner webs of the central feathers. Beneath whitish; chin immaculate; throat and jugulum first with large rounded, then cordate, light-brown spots, which, on the breast, become transverse bands or zones covering the remaining under parts to end of crissum; more obsolete, with the ground color soiled with brownish, on the middle of the belly: these bands quite similar in size and proportion to those on the back. A white band from bill over the eye to nape, with a brown one behind the eye; sides of head finely streaked with brownish.

(13,659.) Total length, 7.00; wing, 3.50; tail, 3.40; graduation, .60; exposed portion of 1st primary, 1.30, of 2d, 2.30, of longest, 4th (measured from exposed base of 1st primary), 2.65; length of bill from forehead, .85, from nostril, .53; along gape, 1.00; tarsus, 1.00; middle toe and claw, .82; claw alone, .27; hind toe and claw, .80; claw alone, 37.

This species is very similar in markings and coloration of the upper parts to *C. zonatus;* the principal difference being in the absence of the rufous tinge of the rump, a more distinctly banded tail, and the inner edges of the quills being continuously edged with brownish-white, not spotted with reddish-white. Beneath the difference is very strongly marked, in the continuous transverse bands on the body: the absence of the reddish color of belly, flanks, and crissum, etc.: the longer wings, and other peculiarities of proportion.

To *C. zonatoides*, of Bogota, the resemblance above is almost perfect, and beneath it is quite close; the spots of black instead of pale brown, absence of zones on flanks and crissum (although the spots are transversely elongated), and the rufescence of the posterior region of body will, however, distinguish them. *C. zonatoides* also lacks the longitudinal streaking of blackish and white on the nape seen in *pallescens*, *megalopterus*, and *zonatus*.

In the museum of the Philadelphia Academy I find specimens of a *Campylorhynchus*, labelled "*Picolaptes megalopterus*, Lafr., Amérique Mérid.," which agree perfectly with Lafresnaye's description, and are those referred to by Dr. Sclater, in his paper published in Proceedings Phila. Academy, 1856, 264. These differ very appreciably from the present species in having the light bands above of a purer white and more sharply defined, the feathers of the hood dark-brown, conspicuously streaked centrally with grayish-white (with a reddish tinge on the occiput); the nape similar, the central

light stripe, however, wider and whiter. The under parts are very similar. The bands on the tail are not so decidedly transverse, but an edging of brown along the shafts often divides the light bar. In the other species it is the concealed centres of the hood feathers that are brown (showing only occasionally), with yellowish-gray edges. The nape is much less conspicuously streaked. *C. megalopterus* is considerably larger also, measuring 8.50 inches, the wing 3.70, tail 3.90. This may be a Mexican bird, as stated by Lafresnaye, but more probably it is South American.

I am by no means decided as to what is the true name of this Mexican species, after setting aside that of *megalopterus*. A specimen in the Phila. Acad., from Guayaquil, and labelled "*pallescens*," by Mr. Sclater, agrees very well with a Smithsonian skin from Piura, Peru, No. 11,748. This differs from the Mexican bird in a larger size, and in having a longer tail and shorter wings—tail half an inch longer than the wings instead of being a little shorter or not longer. The top of the head is purer gray, or with less of a yellowish-red tinge; the nuchal streaks much wider and more prominent. The most striking differences, however, are in the proportions above mentioned, as well as the very different geographical distribution.

The question now remains as to which of these two species the name *pallescens* should be applied. As, however, Lafresnaye, in comparing *pallescens* with *zonatus*, says that it differs especially in form from the latter by longer wings; and as while the Mexican bird has much longer wings than the South American, which are just equal to those of *zonatus*, it seems proper to name the Mexican bird *pallescens*, especially as Lafresnaye gives Mexico as the presumed locality of his species. The South American bird (the *C. pallescens* of Sclater's Catal.) may then be called *Campylorhynchus balteatus*.

Campylorhynchus nuchalis is easily distinguished by smaller size; broader stripes on the neck, extending on the back; the rounded marginal white spots, not bands, on the tail, etc.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,659	..	..	Xalapa, Mex.	...	Dr. Sclater.	D'Oca.
13,672	..	..	"	...	"	"
26,366	..	..	"	...	J. Krider.	"
..	76	..	" [region.)	...	Cab. Lawrence.	"
32,471	377	..	Orizaba. (Alpine	...	Prof. Sumichrast.	.....

Campylorhynchus zonatus.

Picolaptes zonatus, LESSON, Centurie Zoologique, Jan. 1831 (at end of description), 210, pl. lxx (erroneously "California").—*Campylorhynchus zonatus*, GRAY, Genera, I, Mar. 1847.—BONAP. Consp. 1850, 223.—SCLATER, Pr. A. N. Sc. 1856, 264.—IB. P. Z. S. 1856, 290; 1859, 363.—IB. Catal. 1861, 17, no. 103.—SCL. & SALV. Ibis, II, 1860, 29 (Guatemala).

Hab. Southern Mexico and Guatemala.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,569	..	..	Mexico.	...	P. L. Sclater.	F. Sumichrast.
30,670	123	..	Mirador, Mex.	Jan. 1863.	Dr. C. Sartorius.	.....
20,397	1,445	..	Choctun, Vera Paz	Jan. 1860	O. Salvin.	.....
30,653	93	..	Alotepeque, Guat.	Dec. 1862.	"	Salvin & Godman.
..	80	..	Guatemala.	...	Cab. Lawrence.	.....

(30,670) Iris brown.

Campylorhynchus capistratus.

Picolaptes capistratus, LESS. Rev. Zool. 1842, 174 (Realejo).—*C. capistratus*, GRAY, Genera, I, 1847.—SCL. Pr. A. N. Sc. 1856, 264.—IB. Catal. 1861, 17, no. 111 (in part).

Hab. Confined to Pacific coast region of Central America?

(30,654.) Whole top of head and nape black. Sides of the lower neck and dorsal surface of body uniform cinnamon red (darkest anteriorly), with the upper tail coverts only obsoletely banded with blackish. On raising the feathers, however, those on the lower part of the back are seen to be streaked longitudinally with white, having the usual blackish suffusion externally. Greater wing coverts and, to some extent, the scapulars, like the back, but with one or two pairs of rather obsolete rounded black spots, separated obscurely by a pale shade of the ground color. Alular feathers black, edged with whitish. Quills black, with five or six pale yellowish-red spots on the outer webs; internally edged irregularly with whitish. Innermost or exposed secondaries with transverse dusky bars. Tail feathers black, broadly terminated by white, which is much soiled with brownish at the end; the lateral feathers with quadrate white spots on the outer web; the central feathers black with rather narrow transverse bands of pale brownish.

Whole under parts uniform yellowish-white, without streaks or spots, soiled with reddish behind; throat purer white; a conspicuous white line from nostrils over eye to nape; lores, and a broad line behind the eye, blackish; rest of cheeks white. Bill black; the inferior edge of lower jaw at base whitish. Legs dark plumbeous.

A second specimen, 29,428, is very similar, excepting in having concealed spots on the dorsal feathers, similar to those described on the scapulars and wing coverts of the preceding. The under parts are entirely immaculate. This probably represents the spring plumage—the former the autumnal

Young specimens not yet fully fledged, in the museum of the Philadelphia

Academy, from San Carlos and elsewhere, exhibit not the slightest trace of spots or other markings on the under surface, and no longitudinal light streaks on the back.

(30,654.) Total length, 6.00; wing, 2.75; tail, 2.65; graduation, .35; exposed portion of 1st primary, 1.10, of 2d, 1.60, of longest, 4th (measured from exposed base of 1st primary), 2.00; length of bill from forehead, .92, from nostril, .56; along gape, 1.06; tarsus, 1.06; middle toe and claw, .80; claw alone, .27; hind toe and claw, .70; claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,654	84	..	Savana Grande, Guat.	1862.	O. Salvin.	Salvin & Godman.
29,428	..	♀	Punta Arenas, C. R.	May, 1863.	Capt. J. M. Dow.	.....

Campylorhynchus rufinucha.

C. rufinucha, Lafr. R. Z. 1845, 339 (Mexico).—*Picolaptes rufinucha*, Less. Descr. 1847, 285 (Vera Cruz).—*C. capistratus*, Scl. P. Z. S. 1859, 363 (Xalapa).

Hab. Eastern and southern Mexico?

I am unable to say whether the following references belong to *capistratus* or *rufinucha*:—

Picolaptes capistratus, Des Murs. Icon. Orn. pl. lxiii.—*Campylorhynchus capistratus*, Scl. P. Z. S. 1859, 371 (Oaxaca).—Ib. Ibis, I, 1859, 9 (Honduras and Belize).

Authors have, I think, been mistaken in referring the *Picolaptes rufinucha*, of Lafresnaye, from eastern Mexico, to the *P. capistratus*, of Lesson, from, and apparently confined to the west coast of Central America. The specimens before me are not in very good condition, but they indicate, both in coloration and proportion, differences which are not readily reconciled. In both species the whole top of the head, with the line back and in front of the eye, are blackish. In *rufinucha*, however, the exposed feathers of the back and scapulars are streaked conspicuously with soiled whitish, with the blackish external suffusion, the black sometimes forming large rounded spots on each side the shaft. The spots on the wings are whitish, rather than brownish-yellow. The tail feathers are black, broadly ended with white, soiled at the end, but the outer webs of all (except the two central), exhibit a series of six or seven quadrate white spots, instead of being fewer in number and confined to the outer feather. The under parts are soiled whitish; each feather, as far as can be ascertained, except perhaps the chin and throat, with two or three very small spots, usually in pairs. The crissum shows conspicuously

three or four black bands on each feather—something similar being seen on the tibiæ. There is a small narrow black line along the edge of the lower jaw. Nothing like these markings are visible in the Smithsonian specimen of *C. capistratus*. The eyes are red, according to Dr. Sartorius.

The differences in proportion are still more striking. The tail is considerably longer, exceeding the wings; and the tarsus is much shorter, being but little longer than the middle toe and claw. The bill is rather longer. The first primary also longer.

Of the two specimens in the collection one has the feathers worn, and is probably in summer dress. The other is moulting and in autumnal livery, thus matching the two Central American skins of *capistratus*.

Total length, 6.50; wing, 2.60; tail, 2.80; exposed portion of 1st primary, 1.15, of 2d, 1.70, of longest (measured from exposed base of 1st primary), 2.00; length of bill from forehead, .95, from nostril, .57; along gape, 1.05; tarsus, .87; middle toe and claw, .78; claw alone, .24; hind toe and claw, .62; claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
28,041	..	..	Mirador, Mex.	...	Dr. Sartorius.	.....
30,869	124	..	"	Oct. 1862.	"	.....

(30,869.) Eyes red.

Campylorhynchus jocosus.

C. jocosus, Scl. P. Z. S. 1859, 371 (Tehuacan, Oaxaca).—Ib. Catal. 1861, 17, no. 109.

Not figured.

Hab. State of Oaxaca, Mex.

(No. 22,381, type.) Bill lengthened. Upper part of head, line from bill to eye, and a stripe behind it blackish-brown; a little lighter towards the occiput. Upper parts grayish-brown, the feathers of the back and scapulars white, with one or two pairs of large rounded blackish spots, separated by whitish or white shaft streaks and shaft spots. On the nape the black and white in streaks, rather than spots, predominate to the exclusion of the ground color. Wings showing six or seven bands of brownish-white across outer webs; inner webs edged with grayish-white. Tail feathers (except central) black above, broadly tipped with white, soiled at the end with brown; the outer webs with four or five quadrate spots of white; the lateral feather with a white patch at end of inner web, next to the terminal white. Markings of central feathers much broken, without regular bands. Upper tail coverts banded transversely. Beneath quite pure white, a little brownish behind, and each feather, except on the chin, with a conspicuous but isolated rounded

spot of black, becoming a transverse bar on the flanks and crissum. No distinct bands on the thigh. Sides of head white except the post-ocular stripe, and another along the lower edge of the lower jaw. A white line from bill over eye. Bill black, rather paler at the base below; legs dark-brown.

Total length, 6.50; wing, 3.00; tail, 3.00; graduation, .41; exposed portion of 1st primary, 1.26, of 2d, 1.90, of longest, 4th (measured from exposed base of 1st primary), 2.20; length of bill from forehead, 1.05, from nostril, .69; along gape, 1.16; tarsus, .94; middle toe and claw, .78; claw alone, .21; hind toe and claw, .68; claw alone, .31.

This species will be readily distinguished from its black-headed allies by lacking the rufous and unstreaked nape, and by having conspicuous black spots beneath. The bill is longer than in the rest of its allies, and the shape of the nostril is somewhat different.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected	Received from	Collected by
22,381	40,711	♀	S. W. Mexico.	...	Verreaux.	Boucard?

(22,381.) Type.

Campylorhynchus humilis.

C. humilis, Scl. Pr. A. N. Sc. Phila. 1856, 263 (Mazatlan).

Hab. Both coasts of Mexico? On west side north to Mazatlan.

(29,225.) Top of head and nape light brownish-red, the feathers anteriorly pointed, and with conspicuous black centres. Back light grayish-red, the feathers with rather irregular black spots in pairs on opposite sides of the webs, with occasional much lighter intervals. The marking much as in *C. rufinucha*, but showing less of the linear streaks, except behind. Markings generally of the wing, tail, and under parts much as in this species. Under parts soiled brownish-white, purer anteriorly, with very obsolete indications of transverse darker bars, and occasional spots on the flanks. Crissum distinctly banded with blackish, tibiæ less so. A conspicuous white line from bill over eye along side of head edged above and below with black. A narrow dusky line from bill to eye, and a reddish-brown one behind it, streaked on its edges with black; sides of neck streaked with black, and a short black line along lower edge of the lower jaw. Bill dark plumbeous black, paler at the base below. Legs dusky.

Total length, 6.40; wing, 2.75; tail, 2.80; graduation, .40; exposed portion of 1st primary, 1.06, of 2d, 1.65, of longest, 4th (measured from exposed base of 1st primary), 1.95; length of bill from forehead, .80, from nostril, .55; along gape, .98; tarsus, .94; middle toe and claw, .75; claw alone, .20; hind toe and claw, .66; claw alone, .30.

This species is readily distinguished from *C. capistratus*, *rufinucha*, and *jocosus*, by the reddish head and post-ocular stripe. Its banded crissum and the spots on the outer webs of the interior tail feathers

separate it from *cinnamomea*. It is less spotted beneath than *rufinucha*. The bill is considerably shorter than in any of these species; the tarsi as short as in *rufinucha*.

The specimens before me agree sufficiently well with the description by Dr. Sclater of *C. humilis*, based on a bird in the museum of the Phila. Academy. Although No. 29,225 is larger than the type, a skin received from Mr. Verreaux, 29,382, agrees more nearly with it in this respect. A skin collected by Mr. Xantus, near Colima, and belonging to the same region as the Mazatlan specimen, is undistinguishable from the Orizaba skin, upon which the description above given is based. In this the iris is said to be red-brown. In the brown head and other characters, as well as the short bill and tarsi, it is related to *C. gularis*, of Sclater, although this appears to present other distinctive characters.

NOTE.—Since writing the preceding description, I have had the opportunity of examining Mr. Sclater's type in the Phila. Academy, from Mazatlan. The species appears to me the same, the type differing only in being of rather duller plumage above, the markings not so well defined, and in having the bars of the crissum less distinct, and externally reduced somewhat to a central spot. There are no distinct spots on the flanks.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
31,920	1,013	..	Colima, Mex.	June, 1863.	J. Xantus.	.....
22,382	40,710	..	Mexico.	...	Verreaux.	.....
29,225	25	..	Orizaba.	...	F. Sumichrast.	.....

(31,920.) Iris red-brown.

The following species of *Campylorhynchus* I have not had the opportunity of examining:—

Campylorhynchus guttatus, LAFR. R. Z. 1846, 94.—*Thryothorus guttatus*, GOULD, Pr. Z. S. 1836, 89 (Mexico).

This species, which has not been referred to by recent writers, belongs to the same section as *C. brunneicapillus*, etc., with reddish-brown head, and back striped longitudinally with white. The throat and breast are said to be spotted with black, the abdomen and sides with smaller spots of the same. Length, 6.75 (probably more); wings and tail three inches each. The description of the tail is not very distinct; but in several respects there is a close relationship to *C. brunneicapillus*, of Lafr., and it is not impossible that it refers to the same species. If from Tamaulipas, like the

Troglodytes leucogastra described by Mr. Gould on the same page, it is certainly the same, as the *C. brunneicapillus* is the characteristic species of that region of Mexico.

Campylorhynchus nigriceps, SCLATER, P. Z. S. 1860, 461.—IB. Catal. 18, no. 112 (near Vera Cruz, Mex.).

This species has a black head and post-ocular stripe like *capistratus* and *rufinucha*, but differs in the black nape like *jocosus*. The back is reddish, barred transversely with black. The body is unspotted white beneath, reddish posteriorly; the tail feathers black, barred on the outer webs, and more obsoletely on the inner web of the lateral, with fulvous, but without the white tips seen in the allies.

Campylorhynchus gularis, SCLATER, P. Z. S. 1860, 462 (Mexico).

This is a very short-billed species, closely allied to *C. humilis* in this respect, as well as in the reddish-brown head. The post-ocular stripe, however, is said to be black, as well as a rictal one. The tail is broadly tipped with white. The two lateral tail feathers have large white spots on both webs (not on the outermost only). The under part, except the throat, with round black spots; in this also differing from *humilis*.

SALPINCTES, CAB.

Salpinctes, CAB. Wiegmann's Archiv, 1847, I, 323. (Type *Troglodytes obsoletus*, SAY.)

This genus is sufficiently characterized in the "Birds N. Am.," as well as in the general synopsis of the family in the preceding pages, for my present purposes. It is, however, especially peculiar among all its cognate genera by having the usual two continuous plates along the posterior half of the inner and outer faces of the tarsus divided transversely into seven or more smaller plates, with a naked interval between them and the anterior scutellæ. At the upper end of the outer plate these divisions or lines of junction are obsolete, becoming more distinct below, and near the inferior extremity the plates are reduced to oval scales. The plate along the inner face is also divided into two or three plates, sometimes more, usually less distinct than on the outer. The posterior edge of the tarsus, instead of being sharp, is usually, though not always, blunted, by the bending round of the outer plate. The lateral toes are quite disproportionate in size, the inner with its claw scarcely reaching beyond the end of the second

phalanx of the middle toe. The tail feathers are as in *Catherpes*, broad and soft.

Salpinctes obsoletus.

Troglodytes obsoletus, Say, Long's Exped. II, 1823, 4 (South Fork of Platte).—Aud. Orn. Biog. IV, pl. 360.—Ib. B. A. II, pl. 116.—Newberry, P. R. R. Rep. VI, iv, 1857, 80.—Heermann, P. R. R. Rep. X, 1859, 41.—*Salpinctes obsoletus*, Cab. Wiegmann's Archiv, 1847, i, 323.—Baird, Birds N. Am. 1858, 357.—Sclater, P. Z. S. 1859, 371 (Oaxaca).

? *Troglodytes latisfasciatus*, Licht. Preis-Verzeich. 1831, no. 82.

Hab. Central regions of the United States, to Mexico. Cape St. Lucas. Not recorded from Pacific slope.

Mexican specimens seem to differ in having the under tail coverts more distinctly and broadly banded; the outer primary half the longest, instead of being considerably less than half. My materials, however (two skins), are not sufficient to decide whether these differences are characteristic, and accompanied by any others.

Young birds, fully grown, differ from adults in the entire absence of any marking on the under surface, not even on the crissum.

A specimen from Cape St. Lucas is decidedly smaller than the more northern ones.

No specimens have been received from the Pacific slope of California, excepting from Fort Tejon, which is near the dividing line. Dr. Heermann speaks of its being common throughout California.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,857	..	♂	Fort Union, Dak.	July 8, '43.	S. F. Baird.	J. J. Audubon.
8,832	..	..	Black Hills.	Sept. 19.	Lt. Warren.	Dr. Hayden.
11,074	..	♀	Fort Bridger, Utah.	July 15, '58.	C. Drexler.	.....
22,044	65	..	Hellgate, Idah.	Aug. 22, '60.	Lt. Mullan.	J. Pearsall.
11,534	..	♂	Fort Defiance, N. M.	...	.....	.....
12,116	..	♀	San Francisco Mts.	Oct. 9, '59.	Capt. Sitgreaves.	Dr. Woodhouse.
25,367	1,090	..	Fort Tejon, Cal.	Nov. 29, '57.	J. Xantus.	.....
32,169	2,882	♀	Cape St. Lucas.	Jan. 1860.	"	.....
23,383	40,722	♂	Mexico.	...	Verreaux.	.....
22,387	40,723	♀	"	...	.....	.....

CATHERPES, Baird.

Catherpes, Baird, Birds N. Am. 1858, 357. (Type *Thryothorus mexicanus*, Swainson.)

This genus shares with *Salpinctes* the great inequality of the lateral toes. The sides of the tarsi, however, as in all the *Troglo-*

dytidæ, excepting *Salpinctes*, are covered with a continuous strip, instead of being divided into small plates.

Catherpes mexicanus.

Thryothorus mexicanus, SWAINSON, Zool. Ill. 2d series, I, 1829, pl. xi (Real del Monte, Mex.).—*Salpinctes mexicanus*, CAB. Wiegm. Arch. 1847, I, 323.—SCLATER, P. Z. S. 1857, 212; 1858, 297 (Oaxaca).—*Troglodytes mexicanus*, HEERMANN, J. A. N. Sc. 2d ser. II, 1853, 63.—IB. P. R. R. Rep. X, 1859, 41.—CASSIN, Illust. Birds Cal. I, 1854, 173, pl. XXX.—*Catherpes mexicanus*, BAIRD, Birds N. Am. 1858, 356.—SCL. Catal. 1861, 18, no. 115.

?*Troglodytes murarius*, LICHT. Preis-Verzeich. 1831, no. 80 (*fide* CAB., speaks of light-blue tail!).

Thryothorus guttatus, LAFR. R. Z. 1839, 99 (Mexico).

Certhia albifrons, GIRAUD, Texas Birds, 1841, pl. viii (N. E. Mexico).

Hab. Central region of North America, from boundary of United States southward into Mexico. Oaxaca. Extends up valley of Colorado.

There is a very great difference in the length of the bill in different specimens of this species. The longest (20,871) measures .75 from nostril, and 1.15 from gape; while in another the bill is .15 shorter.

I have not seen specimens of this bird from any point west of Fort Tejon, although it is said to occur in the Sacramento Valley.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
			Fort Tejon, Cal.	...	J. Xantus.	.....
7,116	66	..	New Mexico.	Feb. 4, '54.	Lt. Whipple.	Dr. Kenneriy.
3,969	175	♂	New Leon, Mex.	...	Lt. Couch.	.....
31,821	2,040	..	Rio Coahuayana.	Sept. 1863.	J. Xantus.	.....
20,871	26	..	Mirador. [Colima.	Oct. 1862.	Dr. Sartorius.	.....

(3,969) Eyes dark-brown. (31,821.) Iris brown.

CINNICERTHIA, LESSON.

Cinnicerthia, "LESSON, 1844," GRAY. (Type *Limnornis unirufus*, LAFR.)

Presbys, CABANIS, Mus. Hein. I, 1850, 80. (Type *P. canifrons* = preceding?)

Bill short, conical, high at base, not notched at tip. Culmen much curved. Nostrils in anterior extremity of nasal groove; broadly open and oval, but with a narrow membrane above. Internal lateral septum apparently revolute, so as to be perpendicular to the central septum, its exposed edge crossing the nasal aperture obliquely forwards. Legs very stout; hind toe and claw nearly as long as the middle, which are much shorter than tarsus. Wings about equal to the much graduated tail. Plumage Wren-like; uniform brown, with dusky lines on wings and tail.

I introduce the diagnosis of the genus merely to complete the

history of the family, as no species belong to Middle or North America. I quote the date of the genus from Gray, not knowing where it is described, unless it be in the Descr. Mamm. et d'Ois. of Lesson, a book to which I have not access.

Two well established species are *C. minutus* (Lafr.) Bogota and *C. rubirostris*, Lafr., Ecuador, both of which I have had the opportunity of examining.

A young bird of *C. rubirostris* differs from the adult in having the anterior portion of body brown, instead of reddish; the basal portion of gape and lower jaw yellowish, not black.

CYPHORINUS, Cab.

Cyphorinus, Cabanis, Temminck, Fauna Peruana, 1845–46, 153. (Type *C. thoracicus*, Tem. = *Thryothorus modulator*, d'Orb.)

Body short and stout. Tail rounded, very short, scarcely more than half the wings, and falling short of the outstretched toes. First primary about half the longest; secondaries developed, nearly as long as the primaries. Bill distinctly notched, but without rictal bristles: about as long as the head; much compressed, and elevated at the base (greatest depth about one-third length), where the culmen is angulated and quite sharp. The nostrils are not in the anterior end of the nasal groove, but in the middle of the nasal membrane against its upper edge, and forming a small, truly circular tubular opening, surrounded by a low wall, the axis of the opening directed apparently obliquely downwards (not horizontally). Legs well developed; tarsi rather longer than middle toe and claw; lateral toes equal, hind toe shorter than the middle. Tarsi 6-scutellate, the scutellæ not very distinct; the sides of legs in one plate. Outer lateral toe with basal joint, and half the next, adherent to basal joint of middle toe; inner lateral with half its basal joint similarly adherent; or, to express the relation otherwise, the whole outer edge of basal joint of middle toe, and half the inner, adherent to the lateral toes.

I have not the opportunity of examining the species upon which the genus was based by Cabanis, but have selected a near ally, *C. lawrencii*, Scl., as probably having the same peculiarities. The genus is a very remarkable one, and not easily mistaken for any other, on account of the characteristics of the circular nostrils surrounded by membrane, etc.

The genus *Cyphorinus*, as given by Dr. Sclater, includes two subgenera—*Cyphorinus* and *Microcerculus*. I find, among his species of *Microcerculus*, two quite strongly marked sections, of which *bambla* and *prostheleucus* are respectively the types, and for the latter I propose the name of *Heterorhina*. A larger number of specimens will be required to decide as to the permanence and value of the characters which appear to present themselves in the skins

before me, and to determine whether the sections shall be considered as of generic or merely subgeneric importance. For the present it will be more convenient to consider them as genera.

Cyphorinus lawrencii.

Cyphorinus cantans, Lawr. Ann. N. Y. Lyc. VII, 293 (not of Cabanis).
Cyphorinus lawrencii, Scl. MSS. Lawrence, Ann. N. Y. Lyc. VIII, 1863, no. 373.

Hab. Isthmus of Panama.

Above reddish-olive, the feathers very obsoletely, almost unappreciably, streaked and waved with dusky. Exposed surface of wing and tail barred distinctly with black. Feathers of forehead tinged with reddish at base. Chin, ears, throat, and upper part of jugulum brownish-red; rest of under parts grayish-olive, tinged on the sides and crissum with rufous. Lining of wing like throat, but paler. The angle of the chin and the side of the lower jaw dusky. A female specimen is similar, but smaller, and lighter on the middle of the belly.

Total length, 5.00; wing, 2.50; tail, 1.55; length of bill from forehead, .90, from nostril, .60; along gape, 1.04; tarsus, 1.00; middle toe and claw, .93; hind toe and claw, .72; claw alone, .35.

This species was first referred by Mr. Lawrence to *C. cantans* (= *musicus*), but on sending specimens to Dr. Sclater, this gentleman decided them to belong to a new species which he named *C. lawrencii*. *C. musicus* (Cayenne) differs in having the breast and belly yellowish-white; the ears streaked with black and white (Burmeister). *C. modulator* (Peru, etc.) is more like it, but much larger, and has the rufous of throat extending further down the body, and passing into whitish.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	87	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean & Galb.
..	87	♀	"	...	"	"

(87.) Type.

MICROCERCULUS, Sclater.

Microcerculus, Sclater, Catal. Am. Birds, 1861, 19. (Type *Turdus bambla*, Bodd.)

General appearance of *Cyphorinus*, the tail still shorter, in type less than half the wings, the feathers soft; the end of outstretched tibia reaching the tip of tail. Bill compressed; the height about one-fourth the length; culmen nearly straight, not angulated or gibbous at base; tip notched, quite abruptly decurved. Nostrils apparently *double*, or with two openings on each side.

I have not had the opportunity of examining the *M. bambla*—type of the genus—and have taken the *philomela*, a near ally, as the standard of reference. This has the general appearance of *Cyphorinus*, but with still shorter and more rudimentary tail; a bill less compressed, and elevated at base, and more decurved at tip; the wings more rounded. The most remarkable peculiarity is seen in the nostrils, which, instead of being single, as is usual among birds, are double, or with two openings. The specimens of *philomela* do not show the characters very satisfactorily, but one opening is apparently crescent-shaped, against the lower side of the nasal groove near the anterior extremity; the chord of the arc nearly parallel with the commissure. The upper border of the aperture is thus formed by a semi-lunar valvular scale, which may fit down close, leaving only a free rounded aperture behind. Above the posterior end of this opening is another one, shorter, more circular, and against the upper edge of the nasal groove. The septum or bridge between the two is narrow: sometimes reduced to a subjacent ridge, in which case the nasal aperture appears single externally.

It is possible that I have misinterpreted the indications of the specimens before me, and that the characters of the nostrils is sufficiently like that in *Cyphorinus* not to authorize generic separation.

The species assigned by Sclater to *Microcerculus*, excepting *C. albigularis*, which is a *Pheugopedius*, form two sections: one with *bambla* as type, with tail soft and less than half the wings; the bill higher; the culmen more elevated and nearly straight above. The second with *leucostictus* as type: the tail firm, and two-thirds the wing; the bill still lower than in the last, and more Wren-like; the nostrils not so much doubly perforate, as with one large oval aperture in the anterior extremity of nasal groove divided by a nearly horizontal septum, which shows in the aperture without being united to it, constituting a free septum rather than a bridge; sometimes reaching up to the level of the aperture, and sometimes low and inconspicuous. The tarsal scales are sometimes distinct on the outer side, sometimes completely fused into one with the lateral plates (*leucophrys*). To this second section, perhaps generic form, I propose to give the name of *Heterorhina*.

Microcerculus philomela.

Cyphorinus philomela, SALVIN, P. Z. S. 1861, 202 (Guatemala).—SCL. Catal. 1861, 358 (*Microcerculus*).—LAWR. Ann. N. Y. Lyc. VII, 1862; Birds Panama, III, no. 311.—*Cyphorinus bambla*, LAWR. Ann. N. Y. Lyc. VII, 1861, 320, no. 185 (iris brown).

Hab. Guatemala to Isthmus Panama.

A specimen, apparently of this species, in Mr. Lawrence's collection, from Panama, differs from a type specimen and Mr. Salvin's description in being entirely without the fuliginous shade of the under parts; these are grayish along the median region, obsoletely varied with dusky; the sides much like the back, the same color tinging all the under parts of body. The blackish margins of the dorsal feathers are scarcely or not at all appreciable; the spots on the coverts are very obsoletely indicated. It is probably a more adult bird than as described by Mr. Salvin.

M. philomela is said by Mr. Salvin to differ from *M. bambla* in having the wing coverts spotted, instead of being banded with white. *M. albigularis*, of Sclater, is said to differ from both in the white throat, and from *philomela* in the white bands of the wing.

Total length, 4.00; wing, 2.05; tail, 1.15; graduation, .33; exposed portion of 1st primary, .80, of 2d, 1.30, of longest, 4th (measured from exposed base of 1st primary), 1.60; length of bill from forehead, .76, from nostril, .48, along gape, .82; tarsus, .80; middle toe and claw, .74; hind toe and claw, .65; claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,660	101	..	Vera Paz, Guat.	...	O. Salvin.	Salvin & Godman.
..	68	♀	Panama.	...	Cab. Lawrence.	M'Lean. & Galb.

HETERORHINA, Baird.

Heterorhina, Baird. (Type *Scytalopus prostheleucus*, Sclater.)

In the introductory synopsis, and in the preceding remarks relative to *Microcerculus*, I have sufficiently indicated the characters of this genus. The following synopsis may serve to distinguish the allied species:—

A. Back brownish-red; head darker; sides of head black, spotted with white.
  a. Throat pure white, continuous with pure white on the breast and belly; wing coverts spotted with white.
    1. Top of head reddish-brown, or like the back.
      Breast and belly soiled white; tarsus .84 . *prostheleuca.*
      Breast and belly pure white; tarsus .90 . *leucosticta.*
    2. Top of head black. (Specimen from the Napo.)
  b. Feathers of throat white, edged with black; breast plumbeous; coverts unspotted.
    1. Top of head reddish or olive brownish; tarsus .90 *griseicollis.*
    2. Top of head black; tarsus 1.00 . . . *leucophrys.*

B. Back and top of head nearly uniform grayish-brown; sides of head whitish, varied with light-brown. Size very small *pusilla*.

Heterorhina prostheleuca.

Scytalopus prostheleucus, SCLATER, P. Z. S. 1856, 290 (Cordova).—*Cyphorinus prostheleucus*, SCLATER, P. Z. S. 1858, 64, 96; 1859, 363, 372 (Oaxaca).—IB. Catal. 1861, 20, no. 125.—SALVIN, Ibis, II, 1860, 272 (Guatemala).

(28,042.) Above brown, passing into deeper rufous to the upper coverts, and into reddish olivaceous on top of head. Chin and throat pure white, passing into a duller white behind; the sides of breast plumbeous; sides of belly, with the crissum, rufous brown like the rump. A distinct white line from bill over eye to nape, bordered above by an obscure black band. All the feathers of side of head and neck are black, with a rounded white spot near the end; there is quite a distinct black line from base of lower jaw margining chin and throat; the lores are black. The tail feathers and exterior webs of secondary quills are rufous, with narrow black bars (these bars narrower than the interspaces). The primaries black, with brownish-gray spots along their outer edges (outermost edged continuously with gray). The greater and middle wing coverts are blackish, many of them with a small white spot near their tips. The bill is black; legs brown.

Total length, 4.40; wing, 2.20; tail, 1.60; exposed portion of 1st primary, .85, of 2d, 1.35, of longest (measured from exposed base of 1st primary), 1.70; length of bill from forehead, .65, from nostril, .44, along gape, .80; tarsus, .84; middle toe and claw, .70; hind toe and claw, .61; claw alone, .27.

In No. 28,042, one of the tail feathers is entirely white, and there is a white feather on the scapulars; this, however, is evidently abnormal.

Other specimens, from Mexico and Guatemala, are similar, but vary somewhat in the degree of purity of white beneath, and in the shade of rufous above. One (91, Lawrence collection) has the black band margining the top of head wider, so as to leave only a small central interspace of brown. This specimen, too, has the bill longer than in others.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,339	1,431	..	Choctum, Vera Paz.	Jan. 1860.	O. Salvin.	.....
22,389	..	♂	Mexico.	...	Verreaux.	.....
28,042	27	..	Mirador, Mex.	...	Dr. C. Sartorius.	.....
..	91	..	Guatemala.	...	Cab. Lawrence.	.....

Heterorhina leucosticta.

Cyphorinus leucostictus, CAB. Wiegm. Archiv, 1847, I, 206 (Guiana and Mexico).—SCLATER, P. Z. S. 1858, 63, 96.—LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 320 (Panama).

Hab. Isthmus of Panama, to Guiana and Ecuador.

A specimen from Panama, in Mr. Lawrence's collection, labelled *C. leucostictus*, has the breast and belly pure white like the throat, and the white spots on side of head larger. The size is considerably less than in *prostheleucus*, while the tarsi are longer. The shoulders are less spotted with white.

Another specimen from the Napo (32,693), labelled *C. leucostictus*, differs from the last in having a longer, slenderer bill. The whole top of head is black; the black bars on the inner or superior secondaries are quite obsolete, those on the outer webs of the exterior ones being changed to dentations. The spotting of the shoulders is restricted to the alular feathers and edge of the shoulders.

Cabanis, in his description of *C. leucostictus*, gives Guiana and Mexico as localities, thus referring also to *C. prostheleucus*. The small size of the specimen described, and the whiteness of all the under parts, would appear to show that the description was based on the Guiana specimen.

(No. 90, from Panama.) Total length, 3.50; wing, 2.00; tail, 1.30; exposed portion of 1st primary, .75, of 2d, 1.25; length of bill from forehead, .67, from nostril, .43, along gape, .76; tarsus, 90; middle toe and claw, .73; hind toe and claw, .62.

(No. 32,693, from the Napo.) Total length, 4.00; wing, 2.10; tail, 1.30; length of bill from forehead, .73, from nostril, .45, along gape, .83; tarsus, .91; middle toe and claw, .76.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,693	34,925	♂	Rio Napo, Ecuador.	...	Verreaux.	.....
..	90	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.

Heterorhina griseicollis.

Merularis griseicollis, LAFRESNAYE, Rev. Zool. 1840, 103 (Bogota).—*Cyphorinus griseicollis*, SCLATER, P. Z. S. 1860, 64 (Ecuador).

Hab. Ecuador; Bogota; Guatemala to Mexico?

(30,658.) Above reddish-brown, with the top of head and nape grayish-olive. Chin and upper part of throat white, passing insensibly into plumbeous gray on the remaining under parts, excepting sides of belly and crissum, which are reddish-brown like rump. A distinct white line from bill over eye to nape,

with a suffusion of black above it on each side of the vertex. Cheek feathers white, narrowly edged all round with black; lores and stripe behind eye black. A black line on each side the chin and upper part of the throat, all the feathers of which are faintly and inconspicuously edged with black. Exposed surfaces of secondaries like back, with obscure transverse lines of black, still more indistinctly seen on the greater coverts. Tail feathers similarly marked. No white spots on the coverts, and but faint indications on the alular feathers.

The grayish feathers of the belly have generally a lighter tip, or obscure terminal light spot; sometimes with a faint appearance of broad bars of whitish and gray.

Total length, 4.00; wing, 2.25; tail, 1.30; exposed portion of 1st primary, .87, of 2d, 1.33; length of bill from forehead, 65, from nostril, .40, along gape, .75; tarsus, .90; middle toe and claw, .76; hind toe and claw, .64.

A specimen in Mr. Lawrence's collection, from Guatemala, differs in a much deeper and more purplish rufous on the back.

Specimens from Mexico are similar, but differ in having the top of the head and nape reddish-brown, similar to the back, only a shade lighter, instead of olive-gray. Should this be constant, as a geographical difference, the Mexican form will be entitled to a distinctive name. None of the specimens agree very well with the description by Lafresnaye of his *Merulaxis griseicollis*, and may all be really distinct, especially in view of the widely different localities.

This species, with a close resemblance to *prostheleucus* and *leucostictus*, may be readily recognized by the plumbeous ashy under parts, the narrow, scarcely appreciable black edgings of the throat feathers, the absence of white spots on the wing coverts, etc. The bill is smaller and more slender.

Smithsonian No.	Collector's No	Sex and Age.	Locality.	When Collected.	Received from	Collected by
26,369	..	..	Xalapa, Mex.	...	J. Krider.	D'Oca.
22,389	37,661	♂	"	...	Verreaux.	.....
..	55	..	..... [Guat.	...	Cab. Lawrence	D'Oca.
30,658	135	..	Volcan de Fuego,	Nov. 1861.	O. Salvin.	Salvin & Godm.
..	92	..	Guatemala	...	Cab. Lawrence.	.....

(22,389.) "*C. prostheleucus.*"

Heterorhina leucophrys.

Troglodytes leucophrys, Tschudi, Conspectus Fauna Peruana.—*Cyphorinus leucophrys*, Cab. Wiegm. Arch. 1847, i, 206.—Sclater, Catal. 1861, 19, no. 123.

Troglodytes guttatus, Hartl. Verz. Mus. Brem. 1844, 28.

Hab. Peru to Costa Rica?

(30,486.) Above dark rufous brown, brightest towards the rump; top of head dusky blackish, the feathers obscurely suffused at the ends with olivace-

ous. A white line from bill over the eye along nape; lores, and a stripe back of the eye, black; all other feathers of the cheeks, chin, and throat, white, narrowly bordered with black. Jugulum dark ashy, middle of breast paler; whole sides of body from and including axillars, the posterior part of belly, anal region, and crissum, dark rufous cinnamon. Exposed surface of secondaries and tail feathers rufous, with transverse dark lines; primaries similar, externally dentated with black and rufous. Bars on tail much broken up. No spots on the coverts; the alular feathers and bend of wing streaked with yellowish-brown.

Total length of skin, 4.80; wing, 2.35; tail, 1.55; exposed portion of 1st primary, .91, of 2d, 1.30; length of bill from forehead, .72, from nostril, .45, along gape, .81; tarsus, .98; middle toe and claw, .82; hind toe and claw, .67; claw alone, .32.

This species is readily distinguished from *H. leucosticta* and *prostheleuca*, by its ashy jugulum, want of spots on the coverts, and streaked throat. From them and *griseicollis* it differs in larger size, much greater extent of rufous on the sides and anal region, darker head, etc. The feathers of chin and throat are edged much more conspicuously with black than in *H. griseicollis*. The outer face of the tarsus forms one continuous plate without division or groove of any kind.

I refer this species to the *C. leucophrys* of Tschudi, although the locality of the specimen is much farther north than heretofore given, and the bird has not been recorded from Panama. As I have not seen a South American specimen, it is possible that a careful comparison may reveal a specific difference.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,486	80	..	San Jose, Costa Rica.	...	Dr. v. Frantzius.	.....

Heterorhina pusilla.

Cyphorinus pusillus, SCLATER, P. Z. S. 1859, 372 (Oaxaca).—IB. Catal. 1861, 20, no. 126.

Hab. Western Mexico (Oaxaca).

Of this diminutive species, which differs considerably in appearance from its allies, the only specimen before me is somewhat defective, especially about the bill, so that I am unable to say how closely it agrees, if at all, with the other *Heterorhinæ* in their peculiarities. The upper parts are of a grayish-brown, rather brighter behind; the wings and tail obsoletely marked with transverse dark lines. A line from bill over eye, and under parts dull white; the

flanks, anal region, and crissum somewhat like the back, but paler; the sides of the breast tinged with plumbeous. Length, 3.50; wing, 2.05; tail, 1.35.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,386	40,727	♂	Mexico (Oaxaca?)	...	Verreaux.	.....

(22,386.) Type.

THRYOTHORUS, VIEILL.

Thryothorus, VIEILLOT, Analyse, 1816, 45. (Type *Troglodytes arundinaceus*, "*Troglodyte des Roseaux*," VIEILL. Ois. Am. Sept. II, 1807, 55 = *Sylvia ludoviciana*, LATH.)

Bill compressed, rather slender; height about one-fourth the length above. Culmen and commissure gently curved throughout; gonys straight; tip very obsoletely notched. Nostrils in the lower edge of anterior extremity of the nasal groove, narrowly elliptical, overhung by a stiff scale-like roof of the thickened membrane of the upper part of the nasal groove, the crescentic edge rounded. The septum of nostrils imperforate; the posterior part of the nasal cavity with a short septum projecting into it parallel with the central, not perpendicular as in *Microcerculus*. Wings and tail about equal, the latter moderately rounded; the first primary more than half the second, about half the longest. Tarsi rather short, scarcely exceeding middle toe. Anterior scutellæ distinct, rest of each side of tarsi in a continuous plate. Lateral toes equal.

The type of the genus, as established by Vieillot, is his *Troglodytes arundinaceus*, by G. R. Gray and others referred to the *Cistothorus palustris*, but while the account of the nidification and general habit applies best to the latter, the description and figure unquestionably relate to *T. ludovicianus*. (See also Baird, Birds N. Am. 1858, 359.)

As remarked elsewhere, the Wrens formerly included in the genus *Thryothorus* are found to embrace several distinct groups characterized by the form of the nostrils, and to some extent by the shape of the bill and the degree to which this is notched at the tip. As restricted, the species of *Thryothorus*, characterized by the linear nostrils moderately overhung by a thickened scale, all belong to North America, and constitute two sections: one with *T. ludovicianus* as type; the other (*Thryomanes*, Sclater) with slenderer, longer bill, and the tail longer than the wings, its feathers broader, best represented by *bewickii*. The other divisions—*Pheugopedius* and *Thryophilus*—are peculiar to Middle and South America.

The characters of these two divisions will be found detailed in the introductory remarks, and under their respective heads. *Troglodytes*, with its two sections, is very closely related to *Thryothorus*, as restricted, so much so that it is very difficult to draw the line. The supposed differences referred to by many authors resulted from the comparison of *Troglodytes* with *Thryophilus*, rather than with true *Thryothorus*.

In the following synopsis I present an artificial key to the species of *Thryothorus*, *Pheugopedius*, and *Thryophilus*, found in North and Middle America, with their nearest South American allies, and based entirely on color and markings. *T. pleurostictus* I know only by description, and may not have worked it in properly. A more natural arrangement, based upon the peculiarities of structure, follows the first.

Synopsis of Species.

A. Head above and back of much the same color.
  a. Crissum barred transversely; rest of under parts spotted or banded conspicuously with black (except in *felix*).
    1. Outside of wings banded; head like the back.
      α. Throat white; rest of under parts black, finely banded with white . . . *fasciato-ventris.*
      β. Under parts pure white; sides from neck to crissum banded with black . *pleurostictus.*
    2. Outside of wings plain; head more rufous than the back. Sides of head and neck white, conspicuously streaked with black; wings longer than tail, except in *felix*.
      α. Beneath white, spotted with black from chin to belly. Flanks rusty . . *maculipectus.*
      β. Chin and upper throat black, spotted with white; rest of under parts plain rufous . . . . . *rutilus.*
      γ. Beneath whitish, unspotted; on sides brown. Upper tail covert barred. Tail longer than the wings . . . . *felix.*
  b. Crissum barred transversely; rest of under parts plain.
    1. Upper tail coverts and exposed surface of wings barred.
      α. Tail feathers reddish-brown, barred with black. Greater wing coverts spotted with whitish.
        1. Beneath rusty white . . . *ludovicianus.*
        2. Beneath rusty brown . . . *berlandieri.*

3. Tail feathers, except central, black on the outer surface and tips only barred with white.

1. Bill and legs very stout; the former longer than the head. Wings longer than tail. Concealed ruddy half color of white streaks.

Color much as in *H. leucuri*, but winter beneath. Outside of wings very distinctly banded *peruvianus*.

2. Bill and legs more slender; sometimes the bill shorter than head. Tail longer than the wings. Concealed ruddy half color.

Above dark ruddy brown; beneath glistening white; flanks tinged with brown. Rump and upper tail coverts distinctly barred. Quills and middle tail feathers brownish-black . *harrisi*.

Above ashy-brown; beneath, including flanks, clear white; rump ashy, and like remainder, very distinctly barred. Quills and middle tail feathers grayish-brown . . . *leucopygus*.

Colors intermediate between the two last. Bill longer, from nostril .50, from gape .71, instead of .39 and .57 . . *spilurus*.

2. Expanded surface of wings barred; upper tail coverts not barred. Beneath white. Tail feathers reddish-brown, banded with black, except in *petronius*.

a. Above quite uniform reddish-chestnut.

1. Sides ashy . . . . . *poliopleura*.
2. Sides brownish . . . . *rufiventris*.

b. Grayish-brown above, rump rufescent.

1. Sides brownish . . . . *sinaloa*.

c. Crissum plain, without bands.

1. Outside of wings obsoletely banded. Beneath white; flanks and crissum fulvous.

a. Bill shorter than tarsus . . . *mocsetus*.

2. Outside of wings and wing coverts distinctly banded. Beneath white; flanks and anal region very pale fulvous.

a. Bill longer than tarsus . . . *albipectus*.

3. Similar to last above; throat white; rest of under parts fulvous.

a. Wings considerably longer than tail; bill shorter than tarsus . . .	*galbraithi.*
β. Wings little longer than tail; bill longer than tarsus	*longirostris.*[1]
B. Head black, with white cheek-patch; rest of upper part deep chestnut.	
a. Throat white, passing into chestnut behind. Sides obsoletely banded with black	*castaneus.*
b. Beneath white, tinged with rufous on abdomen. Throat plain; rest of under parts barred transversely with black	*nigricapillus.*
c. Beneath white, tinged with chestnut on flanks and anal region. Whole under parts from bill to tail banded transversely with black . . .	*schottii.*

The following is the more natural arrangement of the species just mentioned, as based upon their peculiarities of form:—

Thryophilus: *rufalbus, poliopleura, sinaloa, modestus, albipectus, galbraithi, striolatus, longirostris, castaneus, nigricapillus, schottii.*

Pheugopedius: *fasciato-ventris, pleurostictus? maculipectus, rutilus, felix, coraya, melanos.*

Thryothorus: *ludovicianus. berlandieri, petenicus.*

Thryomanes: *bewickii, spilurus, leucogaster.*

These are followed by the species of **Troglodytes, Anorthura, Cistothorus,** and **Telmatodytes,** synopses of which will be given further on.

The following species of the group of *Troglodytidæ* I have not had the opportunity of examining:—

Thryothorus pleurostictus, Sclater, Ibis, 1860, 30 (Guatemala).—Ib. Catal. 1851, 21, no. 136. See page 121 ("Gulf of Nicoya," Salvin in letter).

Thryothorus murinus, Hartlaub, Rev. and Mag. Zool. 1852, 4 (Rio Frio, between Puebla and City of Mexico). (How near *petenicus* and *albinucha*?)

Troglodytes albinucha, Cabot, Pr. Bost. N. H. Soc. II, 1847, 258 (Yucatan). Possibly *T. petenicus,* and if so, prior to it.

a. Thryothorus.

Thryothorus ludovicianus.

Sylvia ludoviciana, Lath. Ind. Orn. II, 1790, 548.—*Troglodytes ludovicianus,* Licht. Verz. 1823, 35; also of Bonaparte and Audubon.—Prince Max. Cab. Jour. VI, 1858, 110.—*Thryothorus ludovicianus,* Bon. List, 1838, etc.—Cab. Mus. Hein. I, 1850, 78.—Baird, Birds N. Am. 1858, 361.—Sclater, Catal. 1861, 20.

[1] See note on *longirostris* and its allies, under *T. galbraithi,* p. 132.

Troglodytes arundinaceus, VIEILL. Ois. Am. Sept. II, 1807, 55, pl. cviii. (Certainly this species: the habits those of *C. palustris*.)

Certhia caroliniana, WILSON, Am. Orn. II, 1810, 61, pl. xii, fig. 5.

Thryothorus littoralis, VIEILL. Nouv. Dict. XXXIV, 1819, 56.

Thryothorus louisianæ, LESSON, Rev. Zool. 1840, 262.

Additional figures: AUD. Orn. Biog. I, 1831, pl. 77.—Ia. Birds. Am. II, 1841, pl. 117.

Hab. Eastern Province United States, from New York southward to the Gulf.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,113	..	..	Philadelphia.	...	John Cassin.	.....
1,785	..	..	Maryland.	...	S. F. Baird.	.....
1,097	..	♂	Washington, D C.	June 12, '43.	"	Wm. M Baird.
28,934	..	♂	"	Aug. 6, '58.	Dr. E. Coues.	.....
32,285	..	♂	Macon, Ga.	...	P of. J Leconte.	.....
7,120	..	..	Rockport, Ill.	Jan. 2, '52.	Dr. Kirtland.	.....
10,204	..	♂	South Illinois.	May 9.	R. Kennicott.	.....
7,118	..	..	Ft. Leavenworth.	Jan 20, '55.	Lt. Couch.	.....
12,113	..	♀	Red Fork of Ark.	1850.	Capt. Sitgreaves.	Dr. Woodhouse.
12,114	..	♂	Cherokee Nation.	Aug 4, '49.	"	"

Thryothorus berlandieri.

Thryothorus berlandieri, COUCH MSS. BAIRD, Birds N. Am. 1858, 362, pl. lxxxiii, fig. 1 (New Leon).

Hab. Valley of Rio Grande.

No additional specimens of this species have been noticed since the publication of the "Birds of North America." The differences there indicated appear sufficient to distinguish the species from the allied *T. ludovicianus*. The characters of the two are as follows:—

COMMON CHARACTERS.—Above reddish-brown; rump, exposed surface of wings and tail rather faintly barred with black. Crissum strongly barred with the same. White supra-ocular stripe bordered above by black. Sides of neck much spotted with the same. Wing coverts spotted with whitish.

Beneath whitish, with an occasional wash of reddish.
Sides plain. Bill from nostril, .45 . . . . . *ludovicianus.*

Beneath rufous; lighter on throat and on median line.
Sides obsoletely barred with dusky. Bill from nostril. 56 . . . . . *berlandieri.*

Smithsonian No.	Collector's No	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,122	142	♀	New Leon, Mex.	April, 1853.	Lt. Couch.	.....
7,123	143	♂	"	"	"	.....
7,121	124	..	San Diego, Mex.	Mar. 1853.	"	.....

(7,122.) Eyes brown.

Thryothorus petenicus.

Thryothorus petenicus, SALVIN, Pr. Z. S. May, 1863, 187 (Peten).

(Mr. Salvin's type, No. 112.) Bill longer than the head; tail and wings about equal. Color above reddish-brown; more rufous on the rump. Upper tail coverts grayish-brown, rather obscurely banded with black. Outer edges of primaries marked with grayish and black, of secondaries and whole exposed surface of wing with very obsolete, almost inappreciable dusky bars. Under parts whitish, nearly pure on throat and middle of belly, tinged with fulvous (and with the feathers very slightly tipped with dusky) across the breast; the sides more like the back, but paler. Crissum with broad white and black bars; flanks obscurely barred with dusky. A broad line of white, edged with black, from bill over eye to nape: those of opposite sides connected by a concealed series of black-edged white streaks on the nuchal feathers, which form a half collar with more distinctly marked feathers on the side of neck behind the ear coverts, which are like the back. Lower part of cheek feathers white, edged with dusky. Tail feathers black; the outer webs and tips spotted or blotched with dirty white; the middle feathers ashy-brown, with spotted broken bars of black, about one-third their interspaces. Rump with concealed spots of white. Bill longer than the head.

(Type.) Total length, 5.30; wing, 2.25; tail, 2.25; graduation, .26; exposed portion of 1st primary, .90, of 2d, 1.40, of longest (measured from exposed base of 1st primary), 1.70; length of bill from forehead, .85, from nostril, .55, along gape, .92; tarsus, .86; middle toe and claw, .80; claw alone, .23; hind toe and claw, .65; claw alone, .27.

This species is very similar in coloration and general appearance to the typical styles of *T. bewickii*, from the eastern United States. The bill, however, is much larger and longer, the legs much stouter, and the wings and tail about equal, instead of the latter being longer. In these points it agrees more nearly with *T. ludovicianus*, as well as in the character of the nostrils. The white spots of the nape are, however, wanting in *bewickii*, in which also the wing is more distinctly barred; the bands on the upper surface of the tail twice as numerous; the white markings quite similar; the crissal bars narrower and less prominent.

This species appears closely related to *Thryothorus albinucha*, of Cabot, and *murinus*, of Hartlaub, though differing in some respects from their descriptions. It is quite possible that the two latter may prove to be the same species, even if different from *petenicus*. All seem to agree with *T. bewickii* in the black tail feathers, varied a little with white.

For the opportunity of examining this species I am indebted to Mr. Salvin, who kindly transmitted his unique type for the purpose. (No. 112, Sakleek River, near Peten, Guatemala, April, 1862.)

b. THRYOMANES.[1]

There are three strongly marked geographical varieties, if not species of "Bewick's Wren," separable by quite constant characters. Of these the Mexican (*leucogaster*) and the typical form from eastern North America (*bewickii*) differ most in coloration, while the western (*spilurus*) is intermediate in this respect, but with a longer bill than in the other two. The peculiarities of the three forms may be expressed by the following diagnosis:—

Var. **bewickii.**—Above dark rufous-brown; rump and middle tail feathers sometimes a little paler, and very slightly tinged with gray, and together with the exposed surface of secondaries distinctly barred with dusky. Beneath soiled plumbeous whitish; flanks brown. Crissum banded; ground color of quills and tail feathers brownish-black.

Var. **leucogaster.**—Above ashy-brown; rump and middle tail feathers brownish-ash—the former nearly pure ash; without appreciable bars; bars on secondaries obsolete. Beneath, including inside of wing, pure white, with little or no brownish on the sides. Crissum banded; ground color of the quills and tail feathers grayish-brown.

Var. **spilurus.**—Similar to *bewickii* in color, the bill considerably longer. Length from nostril, .50, gape, .81, instead of .39 and .70.

Young birds from all the localities differ from adults merely in having the feathers of the throat and breast very narrowly and inconspicuously edged with blackish.

Thryothorus bewickii, var. **bewickii.**

Troglodytes bewickii, AUD. Orn. Biog. I, 1831, 96, pl. xviii.—IB. B. A. II, 1841, 120, pl. 116.—*Thryothorus bewickii*, BONAP. List, 1838.—BAIRD, Birds N. Am. 1858, 363.—*Telmatodytes bewickii*, CAB. Mus. Hein. I, 1850, 78.

Hab. Eastern province of United States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
25,282	..	♂	Carlisle, Pa.	April 30, '46.	S. F. Baird.	.....
11,722	..	♂	Liberty Co., Ga.	...	Prof. Leconte.	.....
32,282	..	..	Macon, Ga.	Oct. 1848.	"	.....

Thryothorus bewickii, var. **spilurus.**

Troglodytes spilurus, VIGORS, Zool. Beechey's Voyage, 1839, 18, pl. iv, fig. 1 (California).

[1] *Thryomanes*, SCLATER, Catal. Am. Birds, 1861, 22. (Type *Troglodytes bewickii*, var. *spilurus*.)

Troglodytes bewickii, NEWBERRY, P. R. R. Rept. VI, IV, 1857, 80.—COOPER & SUCKLEY, ib. XII, II, 1860, 190.—*Thryothorus bewickii*, SCLATER, Catal. 1861, 22, no. 141 (in part).

Hab. Pacific slope of United States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
9,517	52	..	Simiahmoo, W. T.	Oct 19, '57.	A. Campbell.	Dr. Kennerly.
7,126	253	..	Ft. Steilacoom.	Feb. 1856.	Dr. G. Suckley.	.....
7,133	..	..	San Francisco, Cal.	...	.....	.....
5,516	..	♀	Petaluma, Cal.	Mar. 8, '56.	E. Samuels.	.....
	14	..	Fort Tejon, Cal.	...	J. Xantus.	.....
7,127?	..	..	Los Nogales, Mex.	Jan. 1855.	Major Emory.	Dr. Kennerly.

Thryothorus bewickii, var. **leucogaster.**

Troglodytes leucogastra, GOULD, P. Z. S. 1836, 89 (Tamaulipas).—BON. Notes Delattre, 1854, 43.

? *Thryothorus bewickii*, SCLATER, P. Z. S. 1859, 372 (Oaxaca).

Hab. Southern borders of United States, into Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,115?	..	♂	San Antonio, Tex.	April 15, '51.	Capt. Sitgreaves.	Dr. Woodhouse.
7,130	..	..	Ringgold Barracks,	Jan. 15, '53.	Major Emory.	J. H. Clark.
3,971	41	♀	Sta. Rosalio, [Tex. Tamaulipas, Mex.	Mar. 1853.	Lt. Couch.	.....
3,970	158	..	New Leon, Guya-	April, 1853.	"	.....
9,119	29,906	..	Mexico. [puco.	...	Verreaux.	.....
22,388	29,907	♂	"	...	"	.....

(3,971.) Eyes dark-brown. (3,970.) Do.

THRYOPHILUS, BAIRD.

Thryophilus, BAIRD. (Type *Thryothorus rufalbus.*)

Bill of *Thryothorus*, but more notched. Nostrils imperforate, broadly oval, situated in the anterior extremity of the nasal groove, bounded behind by bare membrane, but elsewhere by the bony outline of the nasal groove (at least apparently so in the dried skin). The overhanging membranous scale of *Thryothorus* appears thus to be entirely wanting, or reduced to a very rudimentary condition. The vertical septum spoken of in *Thryothorus* as projecting into the posterior extremity of the nasal aperture here appears to be continued forward along the upper edge of the interior cavity of the nostrils to the anterior extremity. Other characters much as in *Thryothorus.*

In the introductory remarks on the *Troglodytidæ* I have already alluded to a genus of American Wrens, the species of which have hitherto been included in the genus *Thryothorus.* They differ, however, in having a much more distinctly notched bill, and in the peculiarly open nostrils, which seem to lack the overhanging scale

or membrane of *Thryothorus* and *Pheugopedius*, leaving the nasal aperture to occupy the anterior extremity of the nasal groove, with the internal lateral septum exposed, but vertical, and extending forward to the anterior extremity of the nostril, not ending abruptly behind. This is a peculiarity very easily appreciated in most cases.

The generic name of *Thryothorus* belongs to *T. ludovicianus* as type. Prince Maximilian has used *Hylemalurus* for a South American Wren (his *platensis*); which, however, Cabanis assures us is strictly congeneric with *Troglodytes aedon* (Journal für Orn. 1860). Finding, therefore, no name ready at hand for this group, I am compelled to make a new one.

The genus differs from *Campylorhynchus* in having a notched bill, and a more open nostril, lacking the supra-nasal ridge or sometimes scale seen in nearly all excepting *C. capistratus*, and its allies; and from this it differs in having the lateral septum exposed, not concealed by the nasal membrane behind; the legs also are much more feeble. *Heleodytes* has much stouter legs, an unnotched bill, the tarsus not longer than the middle toe and claw.

A synopsis of the principal species will be found under *Thryothorus*.

Thryophilus rufalbus, var. rufalbus.

Thryothorus rufalbus, Lafresnaye, R. Zool. 1845, 337, Mexico? (more probably S. America).—Lawrence, Ann. N. Y. Lyc. 1863 (Panama).—Cabanis, Jour. Orn. 1590, 406 (Costa Rica).—Sclater, P. Z. S. 1856, 140 (David, Chiriqui).

?*Troglodytes cumanensis*, Licht. Cab. Jour. 1860, 406 (Carthagena).

Hab. Isthmus Panama; New Grenada; Costa Rica?

Thryophilus rufalbus, var. poliopleura.

Thryophilus poliopleura, Baird.

Thryothorus rufalbus, Sclater & Salvin, Ibis, 1859, 6 (Guatemala); not of Lafresnaye.

Hab. Guatemala.

I find, on comparison of a series of Wrens labelled *T. rufalbus* from different localities, some important differences which appear, taken in connection with the geographical distribution, to be almost of specific value. Cabanis has already suggested a difference of species, although not exactly on the same grounds that present themselves in the specimens before me.

As Cabanis remarks, the typical species of Lafresnaye is probably to be found from northern New Grenada—the locality given of "Mexico" being most likely erroneous. The Bogotan specimens differ in smaller size, less extent of white beneath, and greater

amount of rusty brown on the sides; the sides of the head and neck more streaked with black. These differences are, perhaps, not incompatible with an identity of species, but the Guatemalan bird differs from both in some decided characteristics.

A fine adult Guatemalan specimen, received from Mr. Salvin, has the under parts ashy-white, the flanks almost pure ashy. The under tail coverts are white, banded sharply with black. In all the more southern specimens before me, the under parts are more yellowish-white, the flanks conspicuously pale rufous; the white interspaces of the black crissal bars more suffused with rusty. The legs of the Guatemalan bird appear to be shorter, and the bill lower and smaller.

The following diagnosis may serve to illustrate these differences. In all the specimens the upper parts are bright reddish, or cinnamon brown, less vivid towards the head; the wings and exposed surface of the tail with black bands, much narrower than their interspaces. The upper tail coverts without bands. Beneath white, without any bands, except on the crissum, which is broadly marked with black. A white line from bill over eye, and a brown one behind narrowly margined with black; the sides of the head with the white feathers edged with black; a black line from lower edge of lower jaw bordering the chin :—

Var. **rufalbus.**—Beneath clear white; the sides washed with reddish-brown; black bands on tail about half the width their intervals.

Var. **poliopleura.**—Beneath ashy-white; sides ashy without rusty wash; black bands on tail about one-third their intervals.

As already suggested, the Bogotan bird differs from both the preceding, though most closely allied to the former.

(93, *rufalbus*, Panama.) Total length, 5.80; wing, 2.80; tail, 2.45; length of bill from forehead, .86, from nostril, .53, along gape, .97; tarsus, 1.02; middle toe and claw, .88.

(30,656, *poliopleura.*) Total length, 5.90; wing, 2.70; tail, 2.50; length of bill from forehead, .80, from nostril, .48, along gape, .91; tarsus, .93; middle toe and claw, .80.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
			poliopleura.			
30,655	109	Juv.	Retaleuleu, Guat.	Sept. 1862.	O. Salvin.	Salvin & Godm.
30,656	104	Ad.	Savana Grande, "	1862.	"	"
			rufalbus.			
..	93	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.
..	93	♀	"	...	.....	"
32,694	38,360	♂	Cote ferme.	...	Verreaux.	.....
32,692	31,485	♂	Bogota.	...	"	.....

Thryophilus sinaloa.

Thryophilus sinaloa, BAIRD, n. s.

Hab. N. Western Mexico.

(Type 23,786, ♂.) Bill shorter than the head. Gonys straight. No scale over the nostril. Tarsus longer than the middle toe. Tail well developed; the feathers broad, nearly even, the lateral only graduated; the tip extending a little beyond the outstretched feet. Wings but little longer than the tail.

Above dark olive-brown, with slight reddish tinge; the rump rufous or dark cinnamon; the tail feathers with a shade of the same, still slighter on the outer webs of the secondaries. Tail feathers with six or eight pretty well-defined narrow, transverse black bands (each about half the width or less of the interspaces); these most regular on the outer feathers, and apt to be broken near the tips of some. The outer primaries edged with grayish; the outer webs of the other quills with a series of dusky spots. The under parts, lores, and a stripe over the eye are white. The feathers of the sides of the neck are white, edged with black, as are the posterior feathers of the superciliary stripe running into this neck patch. The ear coverts are grayish-white, obscurely and faintly edged with dusky. The flanks are plain brown, rather lighter than the back. The under tail coverts are white, with three or four well defined black bands, not quite so wide as their interspaces, and suffused along their edges with reddish-brown. Bill light horn color; the lower mandible, except the tip, whitish. Legs lighter than the bill.

(23,786, male.) Total length, 5.00; wing, 2.45; tail, 2.15; graduation, .22; exposed portion of 1st primary, .90, of 2d, 1.30, of longest, 4th (measured from exposed base of 1st primary), 1.80; length of bill from forehead, .72, from nostril, .40, along gape, .84; tarsus, .83; middle toe and claw, .70; claw alone, .20; hind toe and claw, .60; claw alone, 26.

This species is most closely related to *T. rufalbus*, in the white under parts and banded crissum. It is, however, much smaller; the upper parts are grayish, instead of cinnamon red; the sides of the neck much more conspicuously streaked with black. The lores are whitish; the greater coverts spotted with whitish. *T. ludovicianus* has different nostrils; upper parts purplish red; beneath tinged with yellowish. *T. petenicus*, besides many other differences, has the tail black, the outer feathers varied only with white. The banded and white crissum, more striped neck, deeper bars on the wings, etc., distinguish it from *modestus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,780	287	♂	Mazatlan.	July, 1861.	J. Xantus.	.....
23,786	280	♂	"	"	"	.....
34,016	..	♂	"	June, 1862.	Col. A. J. Grayson.	.....
29,361	120	♂	Colima.	Feb. 1863.	J. Xantus.	.....
31,822	1,657	♂	"	"	"	.....

23,786.) Type. (34,016.) Iris brown. (29,361.) Iris brown. (31,822.) Iris reddish-brown.

Thryophilus modestus.

Thryothorus modestus, CAB. Jour. 1860, 409 (San Jose, Costa Rica).—LAWRENCE, Ann. N. Y. Lyc. 1863, no. 375.

Hab. Guatemala to Panama.

(No. 33,266.) Above reddish-brown; grayer on the top of head; brighter behind. Exposed surface of wings obsoletely barred with dusky, scarcely appreciable except on the inner (superior) secondaries. Upper surface of tail reddish-brown, with narrow bars of black, about one-third the width of the interspaces, the upper tail coverts plain. Beneath, including bend and inside of wings, with sides of head, white; the sides of body, anal region, and crissum fulvous, without any bars. A white line over the eye, and a blackish one through it. A few of the ear coverts scarcely appreciably edged with dusky.

Total length of dried skin, 5.10; wing, 2.30; tail, 2.30; graduation, .75; exposed portion of 1st primary, .85, of 2d, 1.30; length of bill from forehead, .72, from nostril, .47, along gape, .77; tarsus, .91; middle toe and claw, .74; hind toe and claw, .60; claw alone, .25.

Mr. Lawrence's specimens, from Isthmus of Panama, are similar, but smaller, and paler, with shorter bill.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,657	120	..	Dueñas, Guat.	1862.	O. Salvin.	Salvin & Godm.
33,266	81	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
..	98	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.

Thryophilus galbraithi.

Thryothorus galbraithi, LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 320, no. 192 (Panama R. R.).

Thryothorus ————, CASSIN, Pr. A. N. Sc. 1860, 193.

Hab. Isthmus of Panama and Carthagena.

(No. 100, ♂.) Above reddish-olivaceous, nearly uniform, except towards and on the tail coverts, which are more rufous. Entire exposed surface of the wings, including coverts, conspicuously barred with black, this color rather narrower than the interspaces; lesser coverts more obsoletely. Chin and throat above white; rest of under parts, including lining of wing, at first pale fulvous, becoming much deeper on the flanks, anal region, and crissum. No indications of any bars beneath. Sides of head, including a line from bill over the eye, white; a brownish line behind the eye, scarcely continued through the whitish lores. Ear coverts white, obscurely edged with dusky. Tail reddish-brown, lighter than the back, with rather broad transverse bars of black about half the width of interspaces. In the male the upper tail coverts are obsoletely barred, like the tail; the female shows no traces of it.

Specimens from the Atrato region are similar, but less intense in coloration, paler beneath, and in this respect approaching *albipectus*.

(No. 100, ♂, Mr. Lawrence's type.) Total length, 5.10; wing, 2.45; tail,

2.10; graduation, .46; length of bill from forehead, .72, from nostril, .50, along gape, .85; tarsus, .92; middle toe and claw, .82; hind toe and claw, .68; claw alone, .30.

This species will be readily distinguished from *T. modestus*, by the very distinct bars on the wings; the broader bars on the tail; the deeper fulvous color beneath, extending over the belly and breast; and the fulvous, instead of white, edge and lining of the wing. The tail is shorter; the toes longer. It is somewhat similar to a species from Paraguay; but is larger, more rufous above, redder, and more regularly barred on the tail, etc. In external appearance it is very much like the *Thryophilus longirostris*, but the bill of the latter is much longer.[1]

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,744	330	..	Turbo, N. Grenada.	...	Lt. Michler.	A. Schott.
21,686	344	♂	"	...	.....	.....
21,687	346	..	"	...	.....	.....
21,692	309	♀	"	...	.....	.....
21,693	..	♀	Carthagena.	...	.....	.....
..	100	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.
..	100	♀	"	...	"	"

(100, ♂.) Type. (100, ♀.) Do.

[1] I find, in the collections of Mr. Lawrence and of the Philadelphia Academy, three quite well marked species of long-billed Wrens (with the bill longer than the tarsus). They all agree in the entire absence of bands or spots on the under parts, and in having the top of head more dusky than the back, rump, and tail coverts. They may be characterized as follows:—

T. striolatus (MAX.).—Dark reddish-brown above, but little lighter beneath, except that the throat and cheeks are white; the jugulum and middle line of the abdomen yellowish-brown. Cheek feathers edged with black. Tail with broad black bands wider than their reddish intervals; those on wings about as wide as their intervals. Bill from forehead, 1.12, from nostril, .78; tarsus, about .95. *Hab.* Rio Janeiro. Cab. A. N. Sc.

T. longirostris (VIEILL.).—Generally similar to preceding, but much paler. Lining of wings fulvous. Dark bands on wings and tail much narrower than their interspaces. Cheek feathers edged with black. Bill from forehead, 1.05, from nostril, .76; tarsus, .90. *Hab.* Bahia. Cab. G. N. Lawrence.

T. albipectus (CAB.)—Above still paler than preceding. Top of head appreciably more dusky; bands on wings and tail about equal to their interspaces. Beneath, including lining of wings, white, slightly soiled with brownish-yellow on the sides and behind. Cheeks pure, continuous white. Bill from forehead, .99, from nostril, .65; tarsus, .98 *Hab.*? Cab. A. N. Sc. (This specimen differs somewhat from Cabanis's description, especially in the pure white cheeks, and may really be different.)

Thryophilus castaneus.

Thryothorus castaneus, LAWR. Ann. N. Y. Lyc. VII, 1861, 321, no. 193 (Panama R. R.).

Hab. Line of Panama R. R.

(No. 99, ♂.) Above dark chestnut-brown; the wings and tail black, their exposed surfaces, except perhaps middle and lesser coverts, banded with chestnut; the two sets of bands about equal on the wings; on the tail the black ones nearly double the others. The second and third lateral tail feathers not banded internally, except at tip. No bands whatever on back and rump. Top and sides of head black; a line from bill over eye, eyelids, and a band from side of lower jaw curving round over the ears, white—the latter bounded inferiorly by a black line from lower jaws bordering the ear behind, and running into the black of the nape. Chin and upper throat white, passing insensibly into reddish-fulvous on the jugulum, and posteriorly into deep chestnut. The breast, sides, and crissum are barred transversely with black, less distinct along the middle line. Inside of wings chestnut.

The white crescent on the side of head is separated from the white lower eyelid by a black space.

Female similar, but smaller, with shorter bill.

Male: Total length, 6.00; wing, 2.75; tail, 2.40; graduation of tail, .70; length of bill from forehead, .90, from nostril, .60; along gape, 1.00; tarsus, 1.03; middle toe and claw, .90; hind toe and claw, .74; claw alone, .35.

Female: Bill from forehead, .80; nostril, .49; gape, .91.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,093	..	..	Panama R. R.	...	Geo. N. Lawrence.	J. M'Leannan.
..	99	♂	"	...	Cab. Lawrence.	M'Lean. & Galb.
..	99	♀	"	...	"	"

(99, ♂.) Type. (99, ♀.) Do.

Thryophilus schottii.

Thryophilus schottii, BAIRD, n. s.

Thryothorus nigricapillus, CASSIN, Pr. A. N. Sc. 1860, 193 (Truando). Not of SCLATER.

Hab. Isthmus of Darien.

Markings above and on the head precisely similar to those of *T. castaneus*. Under parts, from chin to anal region, white, the flanks and crissum tinged with chestnut; the whole extent from chin to tail, including inner wing covert, barred transversely and distinctly with black, the black bars a little the narrower.

No. 17,901. Total length, 5.60; wing, 2.70; tail, 2.25; graduation of tail, .65; exposed portion of 1st primary, .95, of 2d, 1.50, of longest (measured from exposed base of 1st primary), 2.00; length of bill from nostril, .50; along gape, .90; tarsus, .96; middle toe and claw, .85; hind toe and claw, .70.

As stated, this species is very similar above to *castaneus*; the black bars on the tail are rather more continuous. The under parts, however, are white, except flanks and crissum—not chestnut; the bars much more decided, and extending forward over the jugulum, throat, and chin, instead of being unmarked. The resemblance to *T. nigricapillus*, Sclater, from Ecuador, is still closer; this, however, has the throat pure white, instead of being barred with black.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,091	172	..	Truando River, N. G	...	Lt. S. Michler.	A. Schott.
21,099	219	..	Truando Falls, "	...	"	"

PHEUGOPEDIUS, CABANIS.

Pheugopedius, CAB. Mus. Hein. 1850, 79. (Type *P. genibarbis* = *melanos*.)

General characters of *Thryothorus*. The bill, in typical species, much thicker and stouter, as in *Cyphorinus*; height about one-third length above; culmen nearly straight to the rather abrupt extremity. Owing to the greater breadth of the nasal membrane, the overhanging roof of the nostrils becomes more valvular; and, in the dried specimen at least, is very apt to close the nostril, or to leave a very narrow crescentic slit, thus distinguishing the genus very readily from *Thryophilus*. The tail appears more graduated, and exhibits a tendency towards being slightly decurved or arched above and not plane.

I have taken the characters above given partly from *P. melanos*, the type, and partly from *P. fasciato-ventris*. The transition, however, from *Thryothorus* to *Pheugopedius* is quite gradual, through such species as *rutilus* and *maculipectus*. *T. felix* is more like a *Thryothorus* in the bill, and nearest *Pheugopedius* in the tail. A synopsis of the principal species will be found under *Thryothorus*.

Pheugopedius fasciato-ventris.

? Thryothorus fasciato-ventris, LAFRES. Rev. Zool. 1845, 337 (Bogota).—*Cyphorinus fasciato-ventris*, LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 320, no. 186 (Panama).

Cyphorinus albigularis, SCLATER, P. Z. S. 1855, 76, pl. 88 (Panama).

Hab. Bogota to Isthmus of Panama.

(99, ♂.) Above rather bright reddish-brown (especially on the lower back); the exposed surface of wings, including greater coverts, and upper

tail coverts, barred obscurely with black. Lores and ears sooty. Chin, throat, and jugulum white—this color extending round behind the ears. A scarcely appreciable white line over and but little behind the eye. Rest of under parts, including crissum, sooty black, barred transversely and narrowly with white; the flanks strongly washed with rufous. The upper part of the breast almost uniform blackish—this color extending forward so as to margin the white of the neck, but not crossing the white of the cheeks. The tail is blackish, the exposed surfaces narrowly barred with reddish-brown (about one-third their interspaces). Inside of wing spotted with blackish. Bill above blackish; the tip, tomia, and under side horn color. Legs blackish.

The bill in this species is considerably stouter, perhaps higher, than in the type, *P. coraya*, but is otherwise much the same.

Females similar, but smaller, with the white of neck scarcely bordered with black; the white bands beneath less distinct.

(89, ♂.) Total length, 6.00; wing, 2.65; tail, 2.50; its graduation, .80; length of bill from forehead, .90, from nostril, .54; along gape, 1.00; greatest height, .27; width at angle of mouth, .40; tarsus, 1.00; middle toe and claw, .92; claw alone, .28; hind toe and claw, .72; claw alone, .35.

Female: Length, 5.80; bill from nostril, .47; gape, .91.

A Rivoli specimen in the collection of the Phila. Academy, from South America, agrees well with those from Panama.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	89	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.
..	89	♀	"	...	"	"
34,095	..	..	Santa Martha, N. G.	...	Geo. N. Lawrence.	.....

Pheugopedius rutilus.

Thryothorus rutilus, Vieill. Nouv. Dict. XXXIV, 1817, 56.—Ib. Nouv. Dict. II, 627.—Burm. Syst. Ueb. II, 1856, 134 (Brazil).—Sclater, Catal. 1861, 21, no. 134.—Lawrence, Ann. N. Y. Lyc. VII, 1861, 320, no. 189.

Thryothorus rutilans, Sw. Birds Braz. pl. xv.

Hab. N. Brazil and Venezuela, to Isthmus of Panama.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	97	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.

Pheugopedius maculipectus.

Thryothorus maculipectus, Lafr. Rev. Zool. 1845, 338 (Mexico).—Sclater, P. Z. S. 1856, 290 (Cordova).—Ib. 1859, 363 (Jalapa), 372 (Oaxaca).—Ib Catal. 1861, 21, no. 133.—Sclater & Salvin, Ibis, II, 1860, 30 (Vera Paz, Guat.).

Hab. South Mexico to Guatemala.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,384	40,721	..	Mexico.	...	Verreaux.	.....
10,205	..	..	Guatemala.	...	J. Gould.	.....
20,398	1,437	..	Cajabon, Vera Paz.	Jan. 1860.	O. Salvin.	.....
..	96	..	Guatemala.	...	Cab. Lawrence.	.....

Pheugopedius felix.

Thryothorus felix, SCLATER, P. Z. S. 1859, 371 (Oaxaca).—IB. Catal. 1861, 21, no. 136.

Hab. West coast of Mexico (Oaxaca to Mazatlan).

(No. 15, Coll. Salv.) Bill about the length of head; tail longer than the wings, much graduated, the lateral feathers about two-thirds the central. Color of the upper parts light-brown, with a very slight tinge of rufous, which becomes very decided on top of head. Upper tail coverts obscurely barred; wings, however, perfectly plain throughout. Chin and throat white, gradually becoming soiled with fulvous on the median line of body; the sides and flanks of a shade of brownish, paler than the back. Edge of wing white, inside tinged with fulvous. Crissum ashy-white, barred about equally with black. All the feathers of sides of head and neck (including side of lower jaw) white, edged with black, either on both sides or on one only; the black sometimes involving the whole web on one side. A superciliary white stripe from the bill is obscured by the black and white markings. Upper surface of tail feathers light-brown, like the back, with transverse bars of black, one-half to one-third their interspaces, generally interrupted along the median line, sometimes broken up into spots, especially at the ends, the intervals between the bars in places sometimes paler than the ground color. Legs and bill dark plumbeous.

Total length, 5.70; wing, 2.30; tail, 2.70; exposed portion of 1st primary, .90, of 2d, 1.38, of longest, 5th (measured from exposed base of 1st primary), 1.75; length of bill from forehead, .68, from nostril, .45, along gape, .83; tarsus, .82; middle toe and claw, .68; claw alone, .18; hind toe and claw, .59; claw alone, .25.

This species is closely related, in coloration, to *P. rutilus* and *maculipectus;* especially in the color of the back, becoming more rufous on the head and not on the rump; the peculiar and very distinct black and white markings of the entire side of the head, the perfectly plain wings, the banded crissum, the much graduated tail, and wings (the 5th or 6th quills longest), etc. It will, however, be very easily distinguished from *rutilus*, by the absence of black spots on the chin and throat, and of the red of the jugulum; and from *maculipectus*, by the lack of black spots on the breast; from both by the presence of bars on the upper tail coverts. The bill has less of the characters of *Pheugopedius*—being lower, and nearer typical

Thryothorus; in fact, connecting the two; the tail is considerably longer than in the two species mentioned, more as in *T. ludovicianus.*

For the opportunity of first examining this species, I am indebted to Mr. Osbert Salvin (No. 15, Salvin's collection, from Oaxaca, type specimen received from Sallé). Since the above description based on this specimen was written, the Institution has had a skin from Mazatlan, agreeing in all essential respects.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,015	8	♂	Mazatlan, Mex.	June, 1862.	A. J. Grayson.	A. J. Grayson.

(34,015.) Iris brown.

TROGLODYTES, VIEILLOT.

Troglodytes, VIEILLOT, Ois. Am. Sept. II, 1807, 52. (Type *Troglodytes ædon.*)

By most European authors the European Wren is considered as the type of the genus *Troglodytes*—Gray giving 1807 as the date of its creation by Vieillot. In the Ois. Am. Sept., however, the true type is the *ædon* there first named—the European species not being mentioned at all.

The characters of the genus are difficult to define, as they differ but little from *Thryothorus*, and some species connect the two very closely. The nostrils are as in *Thryothorus*, having an incumbent thickened scale overhanging the rather linear nostrils. The bill is shorter, or not longer than the head; straight, slender, and without notch. The tail is considerably graduated, generally shorter or not longer than the wings, which are much rounded.

The bill is straighter, shorter, and more slender than in *Thryothorus;* the size of the species much smaller; the colors plainer, more uniform, and almost entirely without the distinct light superciliary line so general in *Thryothorus* and *Thryophilus.*

The Winter Wren, *T. hyemalis*, agrees with the European species in proportionably much smaller and narrower tail, only about two-thirds the wing. *T. brunneicollis* agrees with it, to some extent, in this respect. In the others the wing and tail are nearly equal.

The following synopsis may serve to illustrate some of the peculiarities of the species:—

A. Tail and wings about equal.

a. Beneath grayish-white. Crissum and flanks distinctly barred. Wing coverts spotted with whitish. Dark bars of tail about half the width of their interspaces.

First primary nearly half the longest. Color above dark-brown, rufous towards tail .	*ædon.*
Wing similar. Above paler brown . .	*ædon*, var. *azteeus.*
First primary half the second. Above paler brown	*parkmanni.*
Somewhat similar to *ædon*, but darker. Sides of head dark, without obscure superciliary streak	*americanus.*

b. Beneath all over yellowish-brown. Crissum banded; flanks indistinctly so or not at all. Wing coverts not spotted. Dark bars of tail more numerous, about equal to their light interspaces. Inside of wings plain.[1]

First primary little more than half the second. Beneath darker fulvous. Bars of flanks inappreciable	*intermedius.*
First primary more than half the longest. Beneath pale fulvous. Flanks quite distinctly barred	*inquietus.*

c. Throat and breast dark yellowish-brown, contrasting with the whitish belly and strongly barred flanks. Inside of wings banded. Bars on tail one-fourth their interspaces. Wing coverts spotted, and scapulars banded with whitish . . . . . *brunneicollis.*

B. Tail very short; only about two-thirds the wing.

a. Pale reddish-brown; dusky bars of upper parts with whitish spots or interspaces . . .	*hyemalis.*
b. Dark rufous above and below; upper parts with few or almost no whitish spots . . .	*hyemalis*, var. *pacificus.*

a. TROGLODYTES.

Troglodytes ædon.

Troglodytes ædon, VIEILL. Ois. Am. Sept. II, 1807, 52, pl. cvii.—IB. Nouv. Dict. XXXIV, 1819, 506.—BAIRD, Birds N. Am. 1858, 366.—SCLATER, Catal. 1861, 22, no. 145.—*Hylemathrous ædon*, Cab. Jour. 1860, 407.

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[1] The South American species resemble those mentioned in this division; but beneath are either banded slightly on the crissum only, or not at all even there.

Sylvia domestica, WILSON, Am. Orn. I, 1808, 129, pl. vii.
Troglodytes fulvus, NUTT. Man. I, 1832, 422.
Other figures: AUD. Orn. Biog. I, 1831, pl. 83.—IB. B. A. II, 1841, pl. 120.

Hab. Eastern province of United States, from Atlantic to the Missouri River.

Autumnal and winter specimens have sometimes a slight fulvous tinge on the breast.

As usual, southern specimens of this species are the smaller, as illustrated by the following measurements.

(28,944, ♂, Washington.) Total length, 4.30; wing, 2.02; tail, 2.05; exposed portion of 1st primary, .74, of 2d, 1.30, of 3d, 1.50, of longest (measured from exposed base of 1st primary), 1.51; length of bill from forehead, .60, from nostril, .37, along gape, .70; tarsus, .66; middle toe and claw, .64; hind toe and claw, .56; claw alone, .25.

(8,641, ♂, Florida.) Fresh specimen before being skinned: Total length, 4.50; expanse of wings, 5.75; wing from carpal joint, 1.75. Prepared specimen: Total length, 4.20; wing, 1.80; tail, 1.76; exposed portion of 1st primary, .70, of 2d, 1.22, of 3d, 1.35, of longest (measured from exposed base of 1st primary), 1.38; length of bill from forehead, .61, from nostril, .39, along gape, .70; tarsus, .65; middle toe and claw, .61; hind toe and claw, .50; claw alone, .24.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,084	..	♂	Carlisle, Pa.	June 14, '43.	S. F. Baird.	.....
12,110	..	♂	Washington, D. C.	May 1, '59.	A. J. Falls.	.....
28,944	113	♂	"	June 12, '58.	Elliot Coues.	.....
28,404	..	..	"	...	C. Drexler.	.....
32,288	..	♀	Macon, Ga.	...	Prof. Leconte.	.....
6,512	..	..	Indian Key, Fla.	...	G. Wurdemann.	.....
8,612	..	..	Cape Florida.	Oct. 30, '57.	"	.....
8,641	..	♂	"	Oct. 23, '57.	"	.....
13,184	..	♂	Nebraska City, Neb.	...	Lt. Mullan.	J. Pearsall.
13,185	..	♀	Sioux City.	...	"	"

Troglodytes ædon, var. aztecus.

Troglodytes ædon, var. *aztecus*, BAIRD.

Hab. Eastern Mexico, from Rio Grande southward.

In a series of Mexican Wrens before me, in addition to well marked specimens of *T. hypædon* and *brunneicollis*, I find a number which I cannot distinguish satisfactorily from *T. ædon*. They have the same proportions with *ædon*, as compared with *parkmanni*—approaching the latter in a paler shade of upper plumage, in which respect there is a slight difference from *ædon*. In most specimens there is a brownish tinge on the breast (very different, however, from *hypædon*) not common in the skins usually seen of *ædon*, but agreeing very well with autumnal skins (as 728, Carlisle, and winter skins

from Florida). No. 26,368, however, probably killed in spring, has the breast gray, and, as in some specimens of *ædon*, the feathers faintly spotted with brownish.

From the paler shade of the upper parts, and possibly a rather smaller size, I am inclined to consider these Mexican specimens as residents, and not migrants from the north.

A specimen (7,139) collected south of the Rio Grande, by Lt. Couch, agrees better with the Mexican variety, than with *T. parkmanni*, to which I had referred it.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,139	54	♂	Charco Escondido, Tamaulipas.	...	Lt. D. N. Couch.	.....
29,206	106	..	Orizaba, Mex.	...	F. Sumichrast.	.....
30,872	..	..	Mirador, Mex.	Dec. 1862.	Dr. Sartorius.	.....
26,368	..	..	Xalapa, Mex.	...	J. Krider.	D'Orca.
..	110	..	"	...	Cab. Lawrence.	"

(7,139.) Eyes dark-brown. (30,872.) Iris brown

Troglodytes parkmanni.

Troglodytes parkmanni, AUD. Orn. Biog. V, 1839, 310.—IB. Synopsis, 1839, 76.—IB. Birds Amer. II, 1841, 133, pl. 122.—BAIRD, Birds N. Am. 1858, 367.—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 1860, 191 (nest).—SCLATER, Catal. 1861, 23, no. 146.

Troglodytes sylvestris, GAMBEL, Pr. A. N. Sc. III, 1846, 113 (California, quotes erroneously AUD. *T. americanus*).

Hab. Western and Middle provinces of United States.

Although the differences between the eastern and western House Wrens, as stated in the "Birds N. Am.," are not very appreciable; yet a comparison of an extensive series shows that they can hardly be considered as identical. The general color above is paler and grayer, and there is little or none of the rufous of the lower back and rump. The bars on the upper surface are rather more distinct. The under parts are more alike, as while *ædon* sometimes has flanks and crissum strongly tinged with rufous, other specimens are as pale as in *T. parkmanni*.

Perhaps the most appreciable differences between the two species are to be found in the size and proportions of wing and tail. The wing in *parkmanni* is quite decidedly longer than in *ædon*, measuring, in males, 2.12 to 2.15, instead of 2.00 to 2.05. This is due not so much to a larger size as to a greater development of the primaries. The first quill is equal to or barely more than half the second in

parkmanni; and the difference between the longest primary and the tenth amounts to .32 of an inch, instead of about .20 in *ædon*, where the first quill is nearly half the length of the third, much more than half the length of the second.

The original description of *T. parkmanni* mentions a more reddish tinge than I detect in any specimens before me, perhaps because the type was younger, or in autumnal dress. The dimensions agree very well.

(7,136, ♂, Steilacoom.) Total length, 4.50; wing, 2.12; tail, 2.12; graduation, .32; exposed portion of 1st primary, .67, of 2d, 1.34, of 3d, 1.53, of longest (measured from exposed base of 1st primary), 1.55; length of bill from forehead, .65, from nostril, .40, along gape, .76; tarsus, .67; middle toe and claw, 62; hind toe and claw, .53; claw alone, .24.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
15,960	317	♀	Chiloweyuck Depot, W. T.	June 17.	A. Campbell.	Dr. Kennerly.
7,136	363	♂	Ft. Steilacoom, W.T.	May 3, '56.	Dr. Suckley.	.....
16,172	366	..	Ft. Crook, Cal.	...	Lt. Feilner.	.....
25,351	237	..	Fort Tejon, Cal.	June 30, '59.	John Xantus.	.....
13,678	..	..	Colorado Riv., Ar.	...	Lt. Ives.	Möllhausen.
32,170	3,446	♂	San Jose, C. St. Lu-	Dec. 5, '59.	John Xantus.	.....
13,781	8	..	Ft. Mass., Col. [cas.	...	Capt. Bowman.	.....
17,199	..	..	Cant. Burgwyn.	...	Dr. Anderson.	.....
11,075	..	♂	Fort Bridger, Utah.	June 10, '58.	C. Drexler.	.....
4,739	..	..	Council Bluffs.	April 29.	Lt. Warren.	Dr. Hayden.
5,275	..	..	Blackfoot Country.	July, 1855.	"	"

(32,170) Iris dark-brown.

Troglodytes americanus.

Troglodytes americanus, Aud. Orn. Biog. II, 1834, 452; V, 1839, 469, pl. 179.—Ib. B. A. II, 1841, 123, pl. 119.—Baird, B. N. A. 1858, 368.

Hab. Northeastern United States.

I am unable to throw any more light upon the relationship of the Wood Wren to the Common Wren, than that presented in "Birds N. Am." It is somewhat similar to *T. parkmanni* in size and proportions, but instead of being paler than *ædon* is much darker.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
295	..	..	United States.	...	S. F. Baird.	J. J. Audubon.
1,906	..	..	"	...	"	"
7,255	..	..	"	...	"	J. Cassin.

Troglodytes intermedius.

Troglodytes (Hylemathrous) intermedius, Cab. Jour. 1860, 407 (San Jose, Costa Rica).

Troglodytes hypædon, Sclater, P. Z. S. 1861, 128 (southern Mexico and Guatemala).—Ib. Catal. 1861, 23, no. 147.

Troglodytes ædon, Sclater, P. Z. S. 1859, 363 (Xalapa).—Sclater & Salvin, Ibis, I, 1859, 9 (Guatemala).

Hab. Costa Rica, Guatemala, and southern Mexico (Oaxaca, *Scl.*).

(No. 33,265.) First primary very nearly half the third. Tarsus and middle toe about equal. Above reddish-brown, with a tinge of olivaceous; very obsoletely banded with dusky; a little brighter on the rump. Wing and tail very dark-brown, banded with the color of the back, the black bands rather the narrower; dusky bands rather more conspicuous on upper tail coverts. An obscure line over eye and the under parts brownish-fulvous, paler on throat and middle of belly, darker on sides; entirely free from bars, except the faintest possible indication on the side of the anal region. Crissum similar, with distinct black bars; the light interspaces whitish in spots. Bill dusky, yellowish at base below.

Total length of the dried specimen, 4.50; wing, 2.00; tail, 1.72; graduation, .35; exposed portion of 1st primary, .74, of 2d, 1.26, of 3d, 1.48, of longest (measured from exposed base of 1st primary), 1.50; length of bill from forehead, .62, from nostril, .40, along gape, .71; tarsus, .73; middle toe and claw, .69; hind toe and claw, .55; claw alone, .25.

A type specimen of *hypædon*, labelled by Dr. Sclater, and received from M. Sallé, agrees in general appearance with the Costa Rican bird, but the bill is stouter and plumbeous below. The color generally is lighter; the quills paler, and their inner edges instead of being ashy, are grayish-white. The wings are shorter.

This species may be easily distinguished from *T. ædon*, and all other more northern allies, by the decided fulvous tinge of the under parts, and the almost entire absence of bars on the flanks or under parts, excepting crissum. The upper parts are more faintly barred. The quills and tail feathers are much darker, without the whitish spotting on outer edge of former; the dark bars on tail more numerous, and nearly as wide as their interspaces, instead of half the width, etc. From most of the smaller South American Wrens, which closely resemble this species in color, it differs in the more decidedly barred crissum, more numerous dark bars on tail, etc.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
33,265	..	..	San Jose, C. R.	...	J. Carniol.	.....
27,948	..	..	Mexico?	...	P. L. Sclater?	.....
29,710	..	♂	Totontepec, Oaxaca.	Jan. 1858.	A. Sallé.	.....

(29,710.) Type of *hypædon*, labelled by Dr. Sclater.

Troglodytes inquietus.

Troglodytes inquietus, LAWRENCE, MSS.

Troglodytes hypædon, LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 320 (Panama R. R.).

Hab. Isthmus of Panama.

(109, ♀.) First primary much developed; more than half the longest. Color above brown, with a grayish tinge towards the head, and slightly rufous on the rump. Exposed surface of wings and tail barred with black (more obsoletely on wing coverts), the dark bars rather the narrower. The back faintly barred. Beneath pale fulvous whitish, lighter on throat and middle of belly; tinged with brown on sides, the posterior parts of which are faintly barred. Crissum barred conspicuously with black, the interspaces yellowish-brown to whitish. Quite a distinct superciliary line. No spots on wing coverts.

Of the two specimens, the ♂ is considerably lighter, almost white beneath.

(109, ♀, Panama R. R.) Total length, 4.50; wing, 2.05; tail, 1.85; graduation, .45; exposed portion of 1st primary, .85, of 2d, 1.31, of longest (measured from exposed base of 1st primary), 1.55; length of bill from forehead, .67, from nostril, .43, along gape, .76; tarsus, .76; middle toe and claw, .72; hind toe and claw, .59; claw alone, .26.

This species was at first considered by Mr. Lawrence to be the same with *hypædon (intermedius)*; but a careful comparison with type specimens has shown their distinctness. It is considerably larger, with longer bill and legs. The first primary is much larger. The colors beneath are paler; the lower part of sides distinctly barred. The upper parts are considerably grayer.

None of the other small American allied Wrens before me (except *T. brunneicollis*) have a first primary decidedly more than half the length of longest, and their tails are longer. The coloring above resembles almost exactly that of *T. parkmanni* and the Mexican var. of *T. ædon*, although the dark bars are more numerous. The under parts are more fulvous; the bars on sides anteriorly less distinct; the bars on the crissum more regular, and better defined. There are no light spots on the wing coverts as in the North American species.

This species comes nearest *ædon* and its allies; while *intermedius* is more like the South American species, with their comparative absence of bars.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	109	♂♀	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.
..	..		"	...	"	"

(109.) Type.

Troglodytes brunneicollis.

Troglodytes brunneicollis, SCLATER, P. Z. S. 1856, 297 (Parada; Oaxaca).—Ib. Catal. 1861, 23, no. 154.

Hab. Southern Mexico.

Bill short, compressed, and straight. First primary more than half longest. Upper parts reddish-brown, brighter on the rump. The back, rump, and wings barred rather distinctly with dusky. The dark bars exhibit a tendency to be succeeded by another bar lighter than the ground color, on the scapulars almost white. Greater wing coverts with a spot of whitish in the end. Beneath, from chin to breast, brownish-buff; middle of belly dull white, with scant spots of brown. Lower part of sides and crissum tinged with dark-brown, banded with suffused whitish and dusky—the dark bars, as on the scapulars, being succeeded by a whitish bar lighter than the ground color. Inside of wings similarly banded. Tail feathers reddish-brown, with zig-zag narrow bars of black; innermost (superior) secondary quills with contour lines of dusky, instead of transverse bars.

(29,709, ♂.) Total length, 4.40; wing, 1.90; tail, 1.85; graduation, .45; exposed portion of 1st primary, .53, of 2d, 1.26, of longest (measured from exposed base of 1st primary), 1.45; length of bill from forehead, .60, from nostril, .35, along gape, .69; tarsus, .70; middle toe and claw, .71; hind toe and claw, .59; claw alone, .27.

This species somewhat resembles *T. hyemalis*, from which, however, its larger size, much longer tail, and browner breast distinguish it. In none of its allies do we find the bands on the under side of the wings, the whitish bars on the scapulars, and the general tendency to have the dark bars succeeded by a whitish one. The legs are unusually stout, the middle toe lengthened, and the 1st primary longer than in any others, except *inquietus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
29,709	7	♂	La Parada, Mex.	Jan. 1861.	A. Sallé.	Type.
29,296	131	..	Orizaba, Mex.	...	F. Sumichrast.	.....

b. ANORTHURA.[1]

Troglodytes hyemalis.

Sylvia troglodytes, WILSON, Am. Orn. I, 1808, 139, pl. viii, f. 6.—*Troglodytes hyemalis*, VIEILLOT, Nouv. Dict. XXXIV, 1819, 514.—AUD. Orn. Biog. IV, 1838, 430, pl. 360.—Ib. B. A. II, 1841, 128, pl. 121.—BAIRD, Birds N. Am. 1858, 369.—SCLATER, P. Z. S. 1856, 290 (Cordova, Mex.).—Ib. Catal., 1861, 23, no. 152.

[1] *Anorthura*, RENNIE, 1831. (Type *Motacilla troglodytes*, LINN.)

Troglodytes europæus, Bon. Obs. Wils. 1825, no. 127.—Nuttall, Man. I, 1832, 427.

Hab. Eastern United States, from Mississippi River. Cordova? *Sclater.*

(No. 31,045, ♂, Washington.) Fresh specimen before being skinned: Total length, 4.10; expanse of wings, 6.00; wing from carpal joint, 1.90. Prepared as dry skin: Total length, 3.50; wing, 1.86; tail, 1.31; graduation, .20; exposed portion of 1st primary, .66, of 2d, 1.20, of longest (measured from exposed base of 1st primary), 1.42; length of bill from forehead, .55, from nostril, .35, along gape, .65; tarsus, .72; middle toe and claw, .65; claw alone, .18; hind toe and claw, .55; claw alone, .26.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
127	..	..	Carlisle, Pa.	Oct. 13, '40.	S. F. Baird.	.....
1,379	..	♀	"	April 22, '44.	"	.....
29,943	625	♂	Washington.	Nov. 14, 61.	D. W. Prentiss.	.....
31,045	..	♂	"	Dec. 28, '60.	Chas. E. Schmidt.	.....
10,206	..	..	Cook Co., Ill.	...	R. Kennicott.	.....
10,207	..	..	Miss. Bottom, Ill.	...	"	.....

Troglodytes hyemalis, var. **pacificus.**

Troglodytes hyemalis, Coop. & Suck. P. R. Rep. XII, 1860, 191 (W. T.).

Hab. Pacific coast U. S.

I find, on comparing series of eastern birds with those from the Pacific slope, that the latter are considerably darker in color above, with little or almost none of the whitish spotting among the dusky bars so characteristic of eastern specimens. The under parts are more rufous, the tarsi appear shorter, and the claws decidedly larger. The two forms seem quite as distinct as *T. ædon* and *parkmanni;* and there is usually no difficulty in at once deciding from which of the two regions any specimen has been derived. The differences are certainly greater than those existing between the eastern *T. hyemalis* and the European Wren, which, as far as I can judge from the single specimen before me, consist mainly in the rather paler colors of the under parts in the latter species, which also are perhaps not so much spotted and barred beneath. The superciliary stripe, too, is lighter and more distinct.

(No. 17,434, ♂, Puget Sound.) Total length, 3.60; wing, 1.84; tail, 1.31; graduation, .28; exposed portion of 1st primary, .62, of 2d, 1.20, of longest (measured from exposed base of 1st primary), 1.40; length of bill from forehead, .56, from nostril, .35; tarsus, .68; middle toe and claw, .65; claw alone, .22; hind toe and claw, .54; claw alone, .27.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,143	267	..	Ft. Stellacoom, W. T.	Mar. 1854.	Dr. Suckley.	.....
17,434	436	♂	Simiahmoo, W. T.	Dec. 22, '59.	A. Campbell.	Dr. Kennerly.
4,601	...	..	Columbia River.	Jan. 27, '56.	.....	.....
14,637	1,117	♂	Fort Tejon, Cal.	...	J. Xantus.	.....

CISTOTHORUS, CABANIS.

Cistothorus, CAB. Mus. Hein. 1850, 77. (Type *Troglodytes stellaris*, LICHT., NAUM.) — *Telmatodytes*, CABANIS, Mus. Hein. 1850, 78. (Type *Certhia palustris*, WILSON.)

a. CISTOTHORUS.

Cistothorus stellaris.

Troglodytes stellaris, "LICHT." NAUMANN, Vögel Deutschlands, III, 1823, 724 (Carolina).—*Cistothorus stellaris*, Cab. Mus. Hein. 77.—BAIRD, Birds N. Am. 1858, 365.—SCLATER, Catal. 22, no. 142 (in part).

Troglodytes brevirostris, NUTT. Man. I, 1832, 436.—AUD. Orn. Biog. II, 1834, 427, pl. 175.—IB. B. A. II, 1841, 138, pl. 124.

Hab. Eastern province of United States.

(No. 3,073, Georgia.) Total length, 4.40; wing, 1.75; tail, 1.75, its graduation, .70; exposed portion of 1st primary, .65, of 2d, 1.06, of longest (measured from exposed base of 1st primary), 1.25; length of bill from forehead, .45, from nostril, .29; tarsus, .65; middle toe and claw, .61; hind toe and claw, .55; claw alone, .26.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,510	..	..	Carlisle, Pa.	Sept. 20, '45.	S. F. Baird.	.....
3,073	..	..	Liberty Co., Ga.	1846.	"	Jos. Leconte.
8,829	..	..	Loup Fork of Platte.	Aug. 30.	Lt. Warren.	Dr. Hayden.

Cistothorus elegans.

Cistothorus elegans, SCLATER & SALVIN, Ibis, 1859, 8 (Guatemala).

Hab. Mexico and Guatemala.

I have not a very good series of specimens before me, although they seem to indicate that the *C. elegans* of Sclater & Salvin is really distinct from the northern bird, and that these authors have been hasty in re-combining them. If not different species they at least are well-marked varieties. The bill of *elegans* is considerably stouter and larger than that of *stellaris*, and the tarsi decidedly longer—the birds themselves being of much the same size. On the back the white streaks do not reach so far back (nearly to the rump

in *stellaris*), and the rump and tail coverts are plain, or with very obsolete markings.

The characters derived from my present materials are as follows, and will probably be substantiated by additional specimens :—

C. stellaris.—White dorsal streaks extending to the rump, which is conspicuously banded with brown, and somewhat spotted with whitish. Beneath, including lining of wings, light cinnamon-brown; throat and belly paler, almost white; sides and crissum very obsoletely barred with darker, and faintly spotted with whitish. Feathers of jugulum like sides, but with the color obscured by the paler edges. Tarsus, .65 long.

C. elegans.—Streaks on back confined to interscapular region; rump and upper tail coverts almost plain reddish-brown. Beneath much paler than in *stellaris*, without any appreciable indication of bars or spots on sides and crissum, or of the fulvous of the jugular feathers. Inside of wings snowy white. Tarsus, .72 long.

(No. 29,207, Mexico.) Total length, 4.20; wing, 1.72; tail, 1.70; graduation, .60; exposed portion of 1st primary, .65, of 2d, 1.09, of longest (measured from exposed base of 1st primary), 1.35; length of bill from forehead, .55, from nostril, .31; tarsus, .72; middle toe and claw, .62; hind toe and claw, .54; claw alone, .27.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,689	140	..	Dueñas, Guat.	Aug. 21, '59.	O. Salvin.	Salvin & Godman.
29,207	56	..	Orizaba, Mex.	...	F. Sumichrast.	.....

(30,689.) Type.

b. TELMATODYTES.

Cistothorus palustris.

Certhia palustris, WILSON, Am. Orn. II, 1810, 58, pl. xii, fig. 4 (Penna). —*Troglodytes palustris*, BON. Obs. Wils. 1824, no. 66.—AUD. Orn. Biog. I, 1831, 500, pl. 100.—IB. Birds Am. II, 1841, 135, pl. 123.—REINHARDT, Ibis, 1861, 5 (Godthaab, Greenland).—*Thryothorus palustris*, NUTT. Man. I, 1832, 439.—*Cistothorus* (*Telmatodytes*) *palustris*, BAIRD, Birds N. Am. 1858, 364.—SCLATER, Catal. 1861, 22.

Thryothorus arundinaceus, VIEILLOT, Nouv. Dict. XXXIV, 1819, 58 (not *Trog. arundinaceus*, VIEILLOT).—*Thryothorus arundinaceus*, BON. Consp. 1850, 220.—*Telmatodytes arundinaceus*, CAB. Mus. Hein. 1850, 78.

Hab. Eastern United States, from the Missouri River; Greenland (Reinhardt); Mexico, and Guatemala?

(No. 1,456, ♂.) Total length, 5.00; wing, 2.05; tail, 1.95; graduation, .62; exposed portion of 1st primary, .78, of 2d, 1.22, of longest (measured from exposed base of 1st primary), 1.50; length of bill from forehead, .67, from

of the two species, being fully represented in specimens of *T. bewickii*, and I think it will be necessary to make *petenicus* a synonym of *albinucha*, and to call the species *Thryothorus albinucha*. The approximation, too, of the localities, is an additional argument in favor of this conclusion.

Total length, 5.10; wing, 2.20; tail, 2.15; exposed portion of 1st primary, .90, of 2d, 1.40, of longest (measured from exposed base of 1st primary), 1.69; length of bill from forehead, .82, from nostril, .54; along gape, .90; tarsus, .84; middle toe and claw, .74; claw alone, .20; hind toe and claw, .61; claw alone, .26.

Family MOTACILLIDÆ.

Bill slender, conical, nearly as high as wide at the base, with slight notch at the tip; the culmen slightly concave above the anterior extremity of the nostrils; short bristles at gape, which, however, do not extend forward to nostrils. Loral feathers soft and dense, but with bristly points; nasal groove filled with naked membrane, with the elongated nostrils in lower edge; the frontal feathers coming up to the aperture, but not directed forward nor overhanging it. Wings lengthened and sharp-pointed; the primaries nine (without spurious first), of which the first three to five, considerably longer than the succe, fedingorm the tip; the exterior secondaries generally much emarginated at the ends; the inner secondaries (so-called tertials) nearly equal to the longest primaries. The tail rather narrow, emarginate. Tarsi lengthened, scutellate anteriorly only, the hind claw usually very long, acute, and but slightly curved (except in *Motacilla*). Inner toe cleft almost to the very base, outer adherent for basal joint only.

The combination of naked nostrils, notched bill, and nine primaries, with the tarsi scutellate anteriorly only, will at once distinguish the *Anthinæ* of this family from the *Alaudidæ*, which they so closely resemble in coloration, habits, and lengthened hind claw. The lengthened, slightly curved hind claw, much pointed wings, emarginated secondaries—the inner ones nearly as long as the primaries—distinguish the family from the *Sylvicolidæ*, with which also it has near relationships.

The following synopsis will serve to define the American genera or subgenera of *Motacillidæ*, although it will not apply to the family as represented in all its old-world members:—

From a careful examination of the data furnished by the tables and indications of localities in the preceding pages, it will be seen that a few species, as *Turdus mustelinus, fuscescens, swainsoni, aliciæ*, and *migratorius, Galeoscoptes carolinensis, Mimus polyglottus?* of the *Turdidæ*, with *Sialia sialis*, of the *Saxicolidæ*, and *Polioptila caerulea* of the *Sylviidæ* occur in the West Indies as winter visitors. The remaining species of these families (except some peculiar to the islands), with the whole of the *Cinclidæ, Paridæ, Certhiadæ*, and *Troglodytidæ*, are entirely wanting. Even the species just named appear to be confined to Cuba—none of them occurring, as far as known, in Jamaica or the other islands, and probably visiting Cuba only as stragglers from Florida, or en route to Mexico and Guatemala via Yucatan.

Of the *Turdidæ* there are several genera peculiar to one or other of the West India Islands. Of North American genera, *Mimus* has peculiar species in the Bahamas, Cuba, Jamaica, and St. Domingo, and *Polioptila* in Cuba.

It will be seen hereafter that these generalizations of distribution are widely different from what prevails among the *Sylvicolidæ*, a much larger proportion of the species being spread in winter over many of the West Indies, with several resident species peculiar to one or more of the group.

Thryothorus albinucha.—Since the preceding sheets on the *Troglodytidæ* were printed, I have had the opportunity of examining the type specimen of Dr. Cabot's *Troglodytes albinucha*, Pr. Bost. N. H. Soc. II, 1847, 258, from Yalahao, Yucatan, April, 1842. I find it agrees almost exactly in size and proportions with *Thryothorus petenicus* of Mr. Salvin, being only a very little smaller. The coloration and markings are precisely similar, the only difference being in the tail. The middle (exposed) feathers in *petenicus* are ashy brown, with spotted or broken bars of black, most distinct and continuous across the middle. The other feathers are black; the exterior webs of the outer two and the ends of outer three marked with quadrate spots of whitish, sometimes tinged with plumbeous. In *albinucha* the upper surface of the tail has a slightly more reddish tinge, and the bars are more broken and irregular. The quadrate whitish or grayish blotches on the inner webs of lateral tail feathers extend nearly to the middle of the feather, instead of being confined to the tips. I do not observe any trace of the dusky tips to the feathers of breast, nor of the obscure dusky bars on the flanks seen in *petenicus*.

These differences are, however. not incompatible with the identity

of the two species, being fully represented in specimens of *T. bewickii*, and I think it will be necessary to make *petenicus* a synonym of *albinucha*, and to call the species *Thryothorus albinucha*. The approximation, too, of the localities, is an additional argument in favor of this conclusion.

Total length, 5.10; wing, 2.20; tail, 2.15; exposed portion of 1st primary, .90, of 2d, 1.40, of longest (measured from exposed base of 1st primary), 1.69; length of bill from forehead, .82, from nostril, .54; along gape, .90; tarsus, .84; middle toe and claw, .74; claw alone, .20; hind toe and claw, .61; claw alone, .26.

FAMILY MOTACILLIDÆ.

Bill slender, conical, nearly as high as wide at the base, with slight notch at the tip; the culmen slightly concave above the anterior extremity of the nostrils; short bristles at gape, which, however, do not extend forward to nostrils. Loral feathers soft and dense, but with bristly points; nasal groove filled with naked membrane, with the elongated nostrils in lower edge; the frontal feathers coming up to the aperture, but not directed forward nor overhanging it. Wings lengthened and sharp-pointed; the primaries nine (without spurious first), of which the first three to five, considerably longer than the succe, fedingorm the tip; the exterior secondaries generally much emarginated at the ends; the inner secondaries (so-called tertials) nearly equal to the longest primaries. The tail rather narrow, emarginate. Tarsi lengthened, scutellate anteriorly only, the hind claw usually very long, acute, and but slightly curved (except in *Motacilla*). Inner toe cleft almost to the very base, outer adherent for basal joint only.

The combination of naked nostrils, notched bill, and nine primaries, with the tarsi scutellate anteriorly only, will at once distinguish the *Anthinæ* of this family from the *Alaudidæ*, which they so closely resemble in coloration, habits, and lengthened hind claw. The lengthened, slightly curved hind claw, much pointed wings, emarginated secondaries—the inner ones nearly as long as the primaries—distinguish the family from the *Sylvicolidæ*, with which also it has near relationships.

The following synopsis will serve to define the American genera or subgenera of *Motacillidæ*, although it will not apply to the family as represented in all its old-world members:—

Motacilla.

Tail longer than the wings; hind claw comparatively short, and considerably curved. Feathers of back without lighter edges; no spots nor streaks on breast. Tail doubly forked, or the central feathers nearly equal to the lateral, and longer than intermediate ones. Tip of wing formed by outer three primaries; the distance between the 3d and4th about one-third that between the 4th and 5th. Tarsi lengthened; claw small; hind toe and claw shorter than the middle, its claw short, considerably curved, less than the toe alone; lateral toes nearly equal . . . . . *Motacilla.*

Anthus.

Tail decidedly shorter than the wings; less than half the whole length of bird; simply emarginate and rounded. Hind claw lengthened; only slightly curved. Feathers of back with paler edges; breast streaked with dusky.

a. *Wings much pointed, and lengthened.*

Point of wing formed by four outer primaries, of which the 4th sometimes a little shorter than 3d. Hind toe and claw as long as middle, shorter than tarsus, the claw alone usually a little longer than the toe itself, and slightly curved; inner toe and claw longer than the outer; outstretched toes falling short of the tip of tail; hind toe and claw shorter than tarsus . . . . . *Anthus.*

Point of wings formed by four outer primaries, the 1st longest, or as long as others. Legs stout, the outstretched toes reaching almost to tip of tail. Hind toe and claw longer than tarsus, the claw very long, but equal to the toe proper . . . . . *Neocorys.*

b. *Wings short, rounded.*

Point of wings formed by four outer primaries of nearly equal length . . . . . *Notiocorys.*

Point of wings formed by five outer primaries, the 1st shorter than 3d . . . . . *Pediocorys.*

MOTACILLA, Linn.

Motacilla, Linn. S. N. 1735. (Type *Motacilla alba.*)

The first mentioned species under *Motacilla*, in the 10th edition of the Systema Naturæ of Linnæus, is *luscinia*, or the European Nightingale. If this work be taken as the starting point of the Linnæan binomial nomenclature, it will be necessary to find some other name for the genus, perhaps *Pallenura*, Pallas (*fide* Gray).

Motacilla alba.

Motacilla alba, LINN. Syst. Nat. 12th ed. 1766, 331.—KEYS. & BLAS. Wirb. Europ. 1840, xlix, and 174.—DEGLAND, Orn. Europ. I, 1849, 433.—RHUSHARDT, Isis, 1861, 6 (Greenland).—NEWTON, Baring-Gould's Iceland, 1863, App. ("rather plentiful").

Figure: GOULD, Birds Europe, 143.

Hab. Continental Europe, rarer in England; Iceland; Greenland (only two specimens seen); Siberia; Syria; Nubia.

(9410, ♂, Nürnberg.) Forehead as far back as above the eyes, with sides of head and neck, white; the remaining portion of head and neck above and below to the jugulum, black; the rest of under parts white. Upper parts ashy gray, including rump; the upper tail coverts tinged with black. Wings with two conspicuous bands and the outer edges of the secondaries white. Tail feathers black; the outer two white, edged with black internally. Bill and legs black.

Length, 7.30; wing, 3.45; tail, 3.90; bill from nostril, .37; tarsus, .86; hind toe and claw, .50.

Motacilla yarrelli, a closely allied species, by some considered a variety only, differs in having the rump black, the ashy of the back glossed with blackish, and with the black edging of the lateral tail feathers broader.

I have given a description of this species on account of its occurrence in Greenland, and thus a member of the Fauna of North America. The specimen described is from Nürnberg, Germany.

ANTHUS, BECHST.

Anthus, BECHST. Gemein. Naturg. Deutschl. 1802 (Agassiz). (Type *Alauda spinoletta*).—BAIRD, Birds N. Am. 1858, 232.

I do not find the generic characters employed by European authors to subdivide *Anthus* very satisfactory or constant. They consist mainly in the varying size of the bill, the relative proportion of the innermost secondaries to the longer primaries, and that of the hind claw to the toe proper. In examining series of the North American species I find considerable variations in this respect among different individuals: in *Neocorys*, for instance, one specimen has the longest secondary equal to the 6th primary; in another nearly equal to the 4th. Similar differences occur in *Anthus ludovicianus*, where also the hind claw is sometimes shorter than the toe itself, sometimes longer.

The most permanent and appreciable characters seem to be those based on the length of the outer primaries: thus in one group, to which we may restrict the name *Anthus*, this tip is formed by the

outer four quills, the fifth being abruptly shorter. To this belong *A. ludovicianus*, and the European *spinoletta*, *obscurus*, *pratensis*, and *cervinus*. In a second section, of which there appear to be no American representatives, the tip is formed by the outer three feathers only, and to it belong *arboreus*, *campestris*, and *richardi*. Each of these has been made the type of a genus: *Pipastes*, *Agrodoma*, and *Corydalla*, respectively, of which the latter has priority of date. *A. arboreus* has the hind claw rather shorter and more curved than the rest.

All the American species of Titlark that I have been able to see, excepting *Anthus ludovicianus*, appear to belong to quite a different type from the European. First among them is the northern *Neocorys*, much like typical *Anthus* in the long pointed wings, and the outer four primaries abruptly longer than the 5th, but differing in considerably shorter tail, and longer legs, which actually reach the tip of tail instead of falling considerably short of it. Most of the South American species again, while most nearly related to *Neocorys* in these respects, differ from both *Neocorys* and *Anthus* in the less pointed wings. Here again there are two sections, one with the tip of the wing formed by four primaries (*Notiocorys*); the other (*Pediocorys*), in which five primaries enter into this tip, the whole wing, the inner secondaries especially, apparently unusually broad; of this last a specimen from Quito (30,912), doubtfully referred to *A. bogotensis* of Sclater, may be considered the type, and to it belongs another species from Uraguay, which I have not attempted to identify, as I cannot make it agree with any described species.

Properly, however, to define the characters of the American Titlarks will require a more complete series of the species than I have at present access to, and for the present I merely indicate the sections above named. If, however, *Neocorys* be retained as a genus, in distinction from true *Anthus*, I cannot well avoid considering the South American forms as again different, and to leave the whole question on a basis for further investigation, I propose to make use of all these names in a subgeneric sense only.

a. ANTHUS, Bechst.

Anthus ludovicianus.

Alauda ludoviciana, GM. S. N. I, 1788, 793.—*Anthus ludovicianus*, LICHT. Verz. 1823, 37; also of AUDUBON & BONAPARTE.—BAIRD, Birds N. Am. 1858, 232.—COUES, Pr. A. N. S. 1861, 220 (Labrador).—SCLATER, P. Z. S. 1856, 296 (Cordova).—IB. Catal. 1861, 24, no. 153.—SCL.

& SALV. Ibis, 1859, 9 (Guatemala).—JONES, Nat. in Bermuda, 1859, 29, autumn.—BLAKISTON, Ibis, 1862, 4 (Saskatchewan).

Alauda rubra, GM.; *Alauda rufa*, WILS.; *Anthus spinoletta*, BON., AUD.; *Alauda pennsylvanica*, BRISS.; ?*Alauda pennsylvanica*, BONN. Encycl. Méth. I, 1790, 319.

?*Motacilla hudsonica*, LATH. Ind. Orn. II, 1790, 503.—VIEILLOT, Encycl. Méth. II, 1823, 447.

Anthus pennsylvanica, ZANDER; *Anthus aquaticus*, AUD.; *Anthus pipiens*, AUD.; *Anthus rubens*, MERREM.; *Anthus reinhardtii*, HÖLBOLL, Fauna Grœnland, (ed. Paulsen), 1846, 25 (Greenland).

Figures: AUD. B. A. III, pl. 140.—IB. Orn. Biog. I, pl. 80.—WILSON, V, pl. 89.

Hab. Whole of North America; Greenland; Bermuda; south to Orizaba, Guatemala, and even Peru? Heligoland, Europe. (*Gätke*). Not noted in West Indies.

In spring the colors are purer than in autumn; the upper parts more grayish-brown, especially on the head and nape, lacking almost entirely the autumnal olivaceous. The reddish tinge of the under parts seems peculiar to the spring dress. The bill and legs also appear blacker than in autumn, and the dark streaks on the breast more confined. The shade of color of the under parts in autumnal specimens varies considerably from whitish to fulvous, as does also the size of the spots. Cape St. Lucas specimens are smaller.

An *Anthus* labelled *A. rupestris* (*obscurus*), from Greenland, is not appreciably different from true *ludovicianus;* the legs being paler merely than in some specimens, and agreeing exactly in this respect with others. The markings of the tail are precisely the same. As the *obscurus* is not recognized by Reinhardt as a Greenland bird, and the *ludovicianus* (*reinhardtii* of Hölboll) is said to be common, I presume there is an error in the label.

This species has a very wide range, extending over the whole of North America, and probably far into South America, as there are specimens in the museum of the Phila. Academy from Peru, which, in their somewhat defective condition, I am unable to distinguish from typical *ludovicianus*. A single instance is recorded of its occurrence in Europe; namely, in the island of Heligoland, in the North Sea, where Herr Gätke has found so many stragglers from America and Asia, many of them unknown in other parts of Europe.

Specimens are in the collection from various localities throughout the United States, from the Atlantic to the Pacific coast, as also from Moose Factory, Rupert House, Grosvater Bay, Labrador, Fort Good Hope, Fort Simpson, Fort Rae (not received from the Yukon or Fort Anderson). Others are as follows:—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,592?	..	..	Greenland.	...	Copenhagen Mus.	.....
32,176	3,398	♂	Cape St. Lucas.	Nov. 23, '59.	J. Xantus.	J. Xantus.
32,462	189	..	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.

(18,592?) Labelled *A. rupestris.*

Anthus pratensis.

Alauda pratensis, Linn. Syst. Nat. 1766, 287.—*Anthus pratensis*, Bechst. Deutsch. Vögel, III, 1807, 732.—Keys. & Blas. Wirb. Europas, 1840, 172.—Zander, Cab. Jour. I, extra ed. heft, 1853, 60.—Paulsen, ed. Hölboll, Faun. Grönlands, 1846, 24.—Reinhardt, Ibis, 1861, 6.—Newton, Gould's Iceland, 1863.

Figures: Gould's Birds Europe, pl. 136.

Hab. Europe generally; accidental in Greenland; common in Lapland (*Newton*).

This species in general form resembles the *A. ludovicianus*, the fifth primary in both being abruptly and considerably shorter than the outer four; the bill and legs quite similar. The average size appears much the same. The upper parts are, however (especially the head and back), more distinctly streaked with dusky; the edge and inside of wing greenish-yellow, not white, and the upper plumage and outer edges of the quills decidedly olive-green. The shafts of the middle tail feathers above are whitish, not dark-brown; the under parts greenish-white, conspicuously streaked with dark-brown. The bill is dusky, the base and edges paler; the legs dusky flesh color, not dark-brown.

I introduce this species here as having been found in Greenland, although Reinhardt mentions only one instance of its occurrence. The specimens examined are from Denmark.

b. Neocorys, Sclater.

Neocorys, Sclater, P. Z. S. 1857, 5. (Type *Alauda spraguei*, Aud.)—Baird, Birds N. Am. 1858, 233.

Anthus spraguei.

Alauda spraguei, Aud. B. A. VII, 1843, 335, pl. 486.—*Agrodoma spraguei*, Baird, Stansbury's Rep. 1852, 329.—*Neocorys spraguei*, Sclater, P. Z. S. 1857, 5.—Baird, Birds N. Am. 1858, 234.—Blakiston, Ibis, 1862, 4 (Saskatchewan).

Hab. Plains of Yellowstone and Upper Missouri to Saskatchewan.

The description of this species, as given in the Birds of North America, was taken from a type specimen received from Mr. Audubon. A second skin, collected by Capt. Blakiston on the Forks of the Saskatchewan, differs in having the tertials nearly as long as the primaries (about one-tenth of an inch shorter). The hind claw, too, is considerably longer, measuring .53 of an inch, instead of .46. In other respects the specimens appear similar. A similar discrepancy in length of hind claw is seen in *Anthus ludovicianus*, where it is sometimes considerably longer than the toe alone.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,884	..	..	Fort Union, Dac.	1843.	S. F. Baird.	J. J. Audubon.
16,766	..	..	Saskatchewan.	...	Capt. Blakiston.	.....

(1,884.) Type specimen.

c. NOTIOCORYS, Baird.

Notiocorys, BAIRD. (See page 151 of present work.)

Anthus rufus.

?Alauda rufa, GM. Syst. Nat. I, 1788, 798 (based on *petite Alouette de Buenos Ayres*, BUFF. pl. enl. 738, 1).

?Anthus rufus, BURM. Syst. Uebersicht, III, 1856, 118 (Brazil).

Anthus rufus, LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama R. R.).

Hab. Isthmus Panama (and eastern South America ?).

(277, Lawr. coll., ♂.) Outer four primaries very nearly equal and longest, the 5th mediate between 4th and 6th. Inner secondaries nearly equal to primaries. Hind toe and claw nearly equal to the tarsus; the claw rather longer than its digit, sharp, moderately curved; outstretched toes reaching the end of tail.

Above dusky brown, the feathers edged laterally with pale fulvous; most so on the hind neck, least on the middle of the back. Beneath soiled white, with a faint tinge of yellowish; perhaps very faintly fulvous on crissum and on breast. A pale line over the eye; ear coverts and sides of neck as described on the hind neck; rest of cheeks slightly specked with dusky. Jugulum and sides of breast, and edge of wing on the inside, with shaft streaks of dusky, which at the ends widen into arrow-shaped spots. Wing feathers edged as described, the 1st primary more gray, the secondaries more olivaceous. Outer tail feathers white, with a streak of dusky along the edge of inner web for basal half, the next similar, with the dusky streak extending nearly to the end of the inner web, and nearly as wide as the white portion. (Third feather wanting in the specimen.) Bill dusky above, pale below, becoming darker to the tip; legs flesh color.

Total length, 4.35; wing, 2.26; tail, 1.94; difference between 1st and 6th quills, .32; length of bill from forehead, .51, from nostril, .35, along gape, .61; tarsus, .77; middle toe and claw, .66; claw alone, .20; hind toe and claw, .70; claw alone, .40

This species is much like *Neocorys spraguei* in appearance, though much smaller (an inch and a half shorter), and with a greenish-yellow gloss on the under parts, wanting in the former. The coloration is otherwise very similar. The wings are shorter and not so much pointed, the 5th quill being half way between the 4th and 6th, instead of being two-fifths of the total distance from the 6th, and three-fifths from the 4th. The hind toe and claw are perhaps not quite as long, but still about equal to the tarsus. Whatever, therefore, be the validity of the genus *Neocorys*, the *N. spraguei* appears to be the nearest relative of the present species, agreeing with it in shorter tail and longer legs compared with *Anthus*, but differing from both in the shorter, more rounded wings.

I am by no means certain of the correctness of identification of the specimen. No South American birds are, perhaps, in a greater state of confusion than the Titlarks; and in the absence of accurate indications of the proportions of the quills, etc., so necessary in defining species which vary so little in color, it is exceedingly difficult to come to an accurate conclusion on the subject. It is not at all improbable that the present species may prove to be undescribed, as it is its diminutive size, rather than anything else, that has caused its reference to the *Alauda rufa* of Gmelin.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	86	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.

d. Pediocorys, Baird.

Pediocorys, Baird. (See page 151 of the present work.)

Although there are no members of the present section known with certainty to belong to North or Middle America, I describe the two South American species before me as a contribution to the history of the genus.

Anthus bogotensis.

Anthus bogotensis, Sclater, P. Z. S. 1855, 109, pl. 101; 1858, 550 (Bogota and Ecuador).

Anthus rufescens, D'Orb. & Lafr. Mag. Zool. 1836.—D'Orb. Voyage, 226 (Bolivia). Not *rufescens* of Temminck.

(30,912, Quito.) Plumage very dense and full on the under parts; wings broad, their point formed by the outer five primaries, of which the 4th is longest; then 3d, and 5th equal 2d, little shorter; the first .14 shorter than the 5th, and .20 longer than 6th, about equal to the longest secondary. Tail moderately forked, rather shorter than the wings. Hind claw quite considerably curved, and short, about equal to its digit.

Feathers of upper parts light brownish-yellow, streaked centrally and conspicuously with dark-brown; scarcely appreciable on the wing coverts, which are more rufous. Ocular regions with under parts pale buff, lighter posteriorly and on chin and lores; darker on the inside of the wings. Sides of neck streaked with dark-brown, and a series of scarcely appreciable dusky spots in the tips of the feathers across jugulum, very few in number (scarcely more than one row). Quills broadly edged internally with dull cinnamon. Outer tail feathers rufous, or brownish-white at tip and for about exterior half, including the region both sides the shaft; second feather with slight streaks of the same along the end of the shaft; other feathers dark-brown, edged like the back. Bill brown, whitish at base below. Legs flesh color.

A second specimen (35,035) agrees much better with Dr. Sclater's description, in being paler on the belly and crissum; darker above; the hind claw longer (.55). The wing formula differs in being 2, 3, 1, 4, 5, and the 6th quill is exactly midway from the 5th and 7th (.17 of an inch).

Total length, 5.75; wing, 3.35; tail, 2.90; length of bill from forehead, .62, from nostril, .37; along gape, .80; tarsus, .90; middle toe and claw, .83; hind toe and claw, .75; claw alone, .40.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,912	..	..	Quito, Ecuador.	...	C. R. Buckalew.	.....
35,035	..	..	Ecuador.	...	J. Akhurst.	.....

Anthus ———.

(21,035, ♂, Uruguay.) Wings not much longer than the tail; the rounded point formed by five outer primaries; wing formula 3.4=2, 1, 5, the latter which is one-fourth the distance from 4th to 6th. Inner secondaries rather shorter than the 5th quill. Feet much as in *Neocorys;* the hind claw nearly straight, rather longer than its digit.

All feathers of upper parts blackish-brown, conspicuously margined on each side (but not at tips) with brownish-yellow, which becomes grayish towards the ends (except perhaps on the lower back); these margins proportionally widest on the hind neck. Under parts soiled white, with a pale brownish or buff (not yellow) tinge; palest on throat, crissum, and middle of belly, deepest on inside of wing and inner margin of quills; the feathers of jugulum, upper breast, and sides of body with conspicuous shaft streaks of blackish-brown; feathers on the sides tinged throughout with pale brownish. Loral, ocular,

and superciliary region grayish-white; rest of cheeks speckled with brownish. The blackish ground color of upper surface of wings almost concealed by the broad edgings of yellowish-brown, varying in shade of color, and becoming much paler on the outer primaries, inner secondaries, and greater wing coverts. Tail feathers dark-brown; the outer brownish or soiled white on the outer web, and on the inner web along the shaft from near the base, widening to the end so as to embrace the tip; next feather with outer web and a short terminal streak only white, the remaining feathers narrowly edged externally with the same. Bill dusky, except at base below; legs flesh color.

Total length, 5.70; wing, 2.95; tail, 2.65; difference between 3d and 5th quills, .10; between 3d and 6th, .36; length of bill from forehead, .56, from nostril, .35; along gape, .65; tarsus, .90; middle toe and claw, .75; claw alone, .22; hind toe and claw, .96; claw alone, .52.

A specimen (26,362) which was sold to Dr. Leidy, as from western North America, is scarcely distinguishable in any respect, except the purer white of tail and rather paler colors; and I am inclined to think that it really came, like the preceding bird, from Uruguay, as it is of precisely the same "make up" of skin, and was obtained from the father of the collector (Chr. Wood), who accompanied Capt. Page. It is, however, proper to state that a brother of this same collector (W. S. Wood) obtained many specimens of birds from the plains east of the Rocky Mountains; and if the bird in question really came thence, it will be necessary to introduce the species into the Fauna of North America.

This species is quite similar in external appearance to *Neocorys spraguei*, and of about the same size. The wings are, however, considerably shorter and more rounded; the point of the wing formed by five, not four quills. The legs are much the same. There is a much greater preponderance of reddish-brown on the upper parts, and of buff below; the axillars are brownish, not grayish-white, and there is much less white (and of less purity) on the tail.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,035	100	♂	Uruguay.	Aug. 1860.	Capt. T. J. Page.	Chr. Wood.
26,362	..	..	Uruguay?	...	Dr. Leidy.	? ?

FAMILY SYLVICOLIDÆ.[1]

The *Sylvicolidæ* are essentially characterized among the Oscines with nine primaries,[2] by their small size, the usually slender and conical insectivorous bill, shorter than the head, without angle in the gape near the base; the toes deeply cleft so as to leave the inner one free almost to its very base (except in *Mniotiltеæ*), etc. The shallow notch at the end of the tongue, instead of a deeply fissured tip, distinguishes the family from the *Cærebidæ*, to some of which there is otherwise so great a resemblance. The absence of abrupt hook

[1] A diagnostic table of families will be given as an appendix to the work.

[2] Although we speak of the *absence* of the outer or first primary, and the *presence* of nine only as characterizing most of the *Oscines*, the expression is not strictly correct, as in all cases where I have made a careful search, I have never failed to find the first primary in a rudimentary condition. Indeed the gradation from the very short, though evident spurious primary of some of the Vireos, to the stage in others of the genus where this primary appears entirely wanting, is merely the difference between its being placed so as to rest on the inner side of the basal portion of the shaft of the outer large feather or moved round so as to lie on its outer side. It occupies the terminal joint of the wing, just as when well developed, and is only overlooked because confounded with the coverts of the primaries. Its presence can easily be demonstrated by comparing the wing of a Thrush, with distinct first primary, and that of a Sparrow, Swallow, or other bird, in which this primary is wanting (very well seen in *Quiscalus*). In the Thrush, for instance, there will be seen the usual coverts on the outside of the primaries, each one with its sheath inserted into that of the corresponding primary, and resting a little on the external side of the barrel of the quill. The first quill lacks a covert; all the rest, nine in number, have one each. The first covert is usually much shorter than the rest, and stands singly when there is a distinct, though abbreviated first primary, as in *Turdus*. In a Sparrow, however, or *Quiscalus*, there appears to be a second short covert, immediately beneath the one just referred to, but which, on examination, is seen to occupy the true place of the deficient first primary. Whenever, therefore, there are apparently only nine primaries, it is probable that two of these short stiff feathers will be found, and with ten distinct primaries only one will be found. When there is any peculiar coloration of the primaries, not seen in the other feathers of the wing, this second of the short feathers will have it, and not the outside one, as will be referred to more particularly hereafter, especially under *Vireo flavifrons*.

and notch in both mandibles separates it from such of the *Vireonidæ* as have nine primaries. To the *Tanagridæ*, through the slender-billed forms as *Chlorospingus*, *Nemosia*, *Chlorochrysa*, etc., the relationship is very close; so much so that, by many, both families are included in one. What the real differences are, I may hereafter be able to point out more satisfactorily than I can at present.

The American *Motacillidæ* are distinguished by the emargination of the outer, and the great elongation of the inner secondaries, as well as by other features referred to under that family. *Anthus*, in particular, differs in the lengthened and slightly curved hind claw.

There is, perhaps, no family to which the relationship is closer than to the *Cærebidæ*. Of equally small size, and, to some extent, of a somewhat similar style of coloration, it is not to be wondered at that many species in each family have been indifferently assigned to either. The genus *Helminthophaga*, for instance, can scarcely be so defined as to distinguish it from *Conirostrum*, excepting by the characters of the tongue, so rarely preserved in a skin. What the external features of distinction are, I hope to show hereafter. I am by no means sure that some species even now retained among the *Sylvicolidæ* would not be more appropriately placed in *Cærebidæ*, as *Helminthophaga bachmani*, *Parula gutturalis*, etc.

The tongue in the *Sylvicolidæ* is horny for the greater portion of its extent; more or less deeply bifid at the tip for about one-fourth or one-fifth the length, the branches fringed or lacerated along their external margin. It is short and rather broad at the base, and not as extensible, as in the *Cærebidæ*. The essential difference in structure from that of the *Cærebidæ* seems to be that, in some of the latter, as *Glossiptila* and *Certhiola*, there is a second vertical plane erected along the inner edge of the bifurcation or division of the tip of the tongue, and more or less perpendicular to it, which is itself lacerated or fringed, so as to increase materially the size of the terminal brush. In *Chlorophanes* and *Dacnis* this vertical plane is folded outward upon the horizontal lamina, and perhaps partially or entirely adherent, and thickening considerably the inner portion of the fork. The primary bifurcation of the tongue, however, in all the *Cærebidæ*, is also much deeper (about one-third the whole length), and the lateral fringe extends much further along the base. There are other differences in the tongues of the *Cærebidæ*, of generic import, which will hereafter be dwelt on more at length.

To the general character of the tongue in the *Sylvicolidæ*, however, that of "*Dendroica tigrina*" forms a striking exception in its approximation to the *Cærebine* character, especially that of *Certhiola*. The

tongue, in this instance, is much longer, and narrower than usual; bifid for more than one-third its length, and fringed at the end, much as in *Certhiola*. It differs from other *Sylvicolidæ*, also, in having the sides of the tongue, from the middle, folded over and down on the upper surface, though not adherent, nor does the lap extend quite to the tip. This characteristic of the fold, and the absence of a vertical fimbriated lamina adherent to the inner edge of the horizontal bifurcation of the tongue, appears essentially peculiar to this bird.

This difference of the tongue in "*Dendroica tigrina*" is so fundamentally great, as compared with all other *Sylvicolidæ*, that were the other characteristics of seasonal changes of plumage, geographical distribution and migration, pattern of coloration, etc. more similar, it would almost warrant our removing it to another family, if not making it the type of a new one. As it is, it becomes necessary to establish a new genus (*Perissoglossa*) for it, left now among the *Sylvicolidæ*, but perhaps hereafter to be transferred elsewhere.

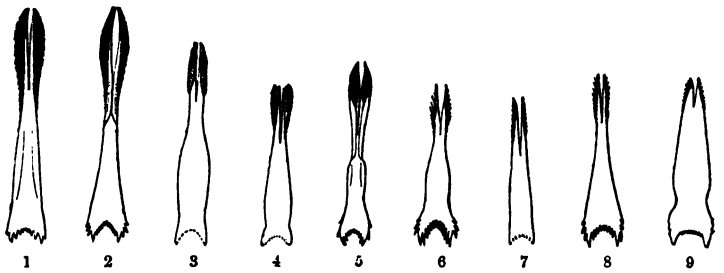
The following diagrams of tongues of some of the *Cærebidæ*, *Sylvicolidæ*, and *Vireonidæ* have been drawn, at my request, on wood under the microscope by Dr. W. Stimpson; to whom, also, I am indebted for the accompanying remarks[1] relative to their charac-

[1] "The tongues are all fissured, or bifid at the extremity, by a slit of variable depth; one-third the length of the tongue in *Glossiptila*, *Certhiola*, and *Perissoglossa*, but only one-sixth its length in *Vireo;* in the others averaging about one-fourth its length. By this slit two forks are formed, which are depressed, corneous, laminiform, and incised along the extremity and outer edge by more or less numerous fissures which form a fringe of flattened setæ contiguous at base, but becoming narrowed and thus separately projecting in the same plane at their extremities. The lateral setæ are transverse or even curved backward in *Glossiptila*, but point obliquely forward in all the other species.

"The inner edge of the fork is always much thicker than the external laminar expansion, and generally ends in a sharp spine, far stronger than the proximate setæ. But in *Glossiptila* and *Certhiola* this inner edge is itself expanded upward into a narrow lamina, which is either in a plane perpendicular to the lateral expansion or folded over toward it, and this second lamina is also divided into oblique or longitudinal setæ toward its extremity. At the extremity of the fork the two laminæ are confluent, continuous, and regularly fimbriated around the curve.

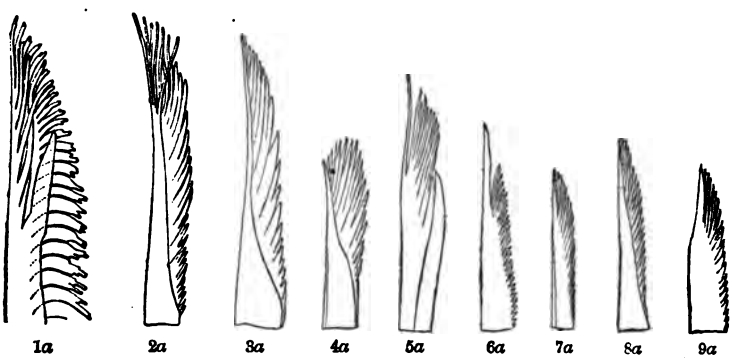
"In *Certhiola* and *Perissoglossa* the sides of the tongue at the base of the forks are folded over and inward, but in *Certhiola* the folds are soldered down to the base and inner edge of the forks; while in *Perissoglossa* they are not soldered, but open outward again anteriorly before the edges become fimbriated, so that the extremity of this tongue (*Perissoglossa*) is broad, and the setæ nearly longitudinal.

teristics as they appeared to him from a purely microscopical point of view.



1. *Glossiptila ruficollis.* Jamaica.
2. *Certhiola bahamensis.* Nassau.
3. *Chlorophanes atricapilla.* Trinidad.
4. *Dacnis cayana.* "
5. *Perissoglossa tigrina.* Nassau.
6. *Dendroica striata.* Nassau.
7. *Helminthophaga celata.* Arctic America.
8. *Teretristis fornsii.* Cuba.
9. *Vireo barbatula.* Nassau.

The following figures represent one branch of the bifurcated tip of each tongue more highly magnified. The references are the same as in the preceding figures.



Nos. 2, 3, 4, and 6 were drawn from alcoholic specimens; 1, 5, 7, 8, and 9 from tongues removed from the dried skin, and therefore perhaps not perfectly accurate.

"The base of the tongue is bifid and armed with teeth pointing backward to prevent the escape of food. The largest teeth are at the extremities of the two points. In *Certhiola*, *Perissoglossa*, *Dendroica*, and *Teretristis* the teeth are all sharp, with the intermediate teeth nearly as large as the terminal ones, and there are two or three teeth on the outer sides of the points. In *Glossiptila* there is only one tooth on these outer edges. *Vireo* differs from all the rest in having a broad and shallow excavation between the two points, which are short, stout, and blunt; and the edge of this excavation is armed with very minute, equal teeth, while there are no true teeth on the outer edges of the points."—*Stimpson.*

In further illustration of the character of the tongue in the *Sylvicolidæ*, I here present the result of an examination of alcoholic specimens of other families, some of these, unfortunately, in poor condition.

TURDIDÆ: *Turdus migratorius* and *swainsoni* have the tongue rather acute, and fleshy, with horny edges and tip, which is almost entire or very slightly bifid, and its sides very little, if at all, lacerated.

SAXICOLIDÆ: *Sialia sialis.* Tongue similar to last, perhaps still less lacerated.

SYLVIIDÆ: *Regulus satrapa.* Tongue rather broad; very slightly lacerated around the ends of the horny part, but apparently not bifid.

These three families seem to agree pretty well in having the tongue either entire at the end, or very slightly bifid or notched, with the edges nearly entire. The appearance of laceration may, to a considerable extent, be due to the softening of the membranes of the horny portion of the tongue, which allows the apparently fibrous basis to be liberated around the edges.

In the *Motacillidæ* and *Sylvicolidæ* the tongue differs in being more horny, more deeply bifid at tip, and the outer edges and tip of the two portions lacerated or coarsely divided into a fringe, usually in the ends, to a less degree on the sides, and in a direction nearly parallel with the axis of the tongue, or radiating from the bottom of the notch. The horny part of the tongue is quite considerable, and the notch involves generally about one-third or one-fourth of it (less of the entire tongue). In making this generalization I have examined the following species:—

MOTACILLIDÆ: *Anthus ludovicianus.*

SYLVICOLIDÆ: *Mniotilta varia; Parula americana; Protonotaria citrea; Geothlypis trichas; Icteria virens; Teretristis fornsii; Seiurus aurocapillus* and *noveboracensis; Dendroica virens, canadensis, coronata, blackburnia, castanea, pennsylvanica, striata, æstiva, maculosa, "tigrina," palmarum, discolor; Helminthophaga celata* and *ruficapilla; Myiodioctes mitratus, pusillus, canadensis; Setophaga ruticilla*—twenty-six species in all. I have not had the opportunity of examining any species of *Helmitherus* or *Oporornis;* nor of *Dendroica superciliosa*, which I much regret.[1]

[1] I am indebted to Prof. Agassiz for the opportunity of examining *Helminthophaga ruficapilla.*

Icteria and *Teretristis* do not differ from the rest, although it has been suggested to place the latter genus in *Cærebidæ*.

The PARIDÆ (*Parus septentrionalis, Auriparus flaviceps, Psaltriparus minimus, Sitta canadensis*) have the tongue thicker and more fleshy than in *Sylvicolidæ;* only moderately horny at ends and tips, and only slightly bifid and lacerated, much less than in *Sylvicolidæ*, and about as in *Turdidæ*, but less horny.

The HIRUNDINIDÆ (*H. horreorum* and *bicolor*) have the tongue short, broad, triangular, quite fleshy, with a shallow notch at end, the sides scarcely or not at all lacerated.

The VIREONIDÆ (*V. crassirostris* and *barbatula*) have the tongue more like the *Paridæ* than the *Sylvicolidæ*.

The characteristics of CÆREBIDÆ, as far as I have been able to examine their tongues, I have already referred to in detail. The other families of Oscines will hereafter be referred to.

In the TYRANNIDÆ the tongues of *Muscivora mexicana, Pitangus derbianus*, and *Todirostrum* are horny for most of their length, nearly linear, or gently tapering to a blunt, almost truncated tip, which is not bifid, but has several short incisions in the end.

In the TODIDÆ the tongue of *Todus viridis* is broad and linear to the blunt tip (shaped like the bill), and throughout horny, thin-edged and entire.

In GALBULIDÆ a *Galbula* from South America has the tongue equally horny, but long, narrow, tapering gently to a point, and without any incision whatever.

In the "Birds of North America" I have dwelt at much length upon the characters by which the North American genera of *Sylvicolidæ* are distinguished, and refer to that work for particulars, reproducing here only some of the diagnostic tables, with a few modifications. These can doubtless be much improved; but I have not time at present to attempt to work them over again, and must content myself here with dwelling in detail only on the forms of Middle and South America. It will be noticed hereafter that while the *Sylvicolinæ* proper belong essentially to North America, it is in Middle and South America that the *Setophaginæ* have the greatest development.

The following synopsis is an attempt at defining the higher subdivisions of the *Sylvicolidæ*. In the large number of species, their close relationships, and the very gradual transition from one form to another, I have found it very difficult to make any arrangement by

which one unacquainted with the subject can readily determine the group to which a species or genus may belong.

Bill conical; its bristles very short, or wanting.

Sylvicolinæ. Bill conical, or about as high as wide, or even higher, opposite the nostrils. Gape with short bristles, not reaching beyond the nostrils or none. Tip of bill not hooked; with or without a faint notch; commissure nearly straight. Wings long and pointed; considerably longer than the narrow, nearly even tail. Legs short and weak; tarsi not as long as the head (except in *Mniotilta*).

Basal joint of inner toe adherent for its basal half; basal joint of outer toe, and part of the next, adherent (in all other *Sylvicolidæ* the inner toe cleft nearly to the base, and second joint of outer toe free). Hind toe lengthened, nearly equal to the middle; the digit considerably longer than the claw. *Creeping Warblers.* Genera: *Mniotilta*, *Parula* . . . . . *Mniotiltæ*

Hind toe but little, if any, longer than the lateral; the digit about equal to the claw.

Bill entirely without notch, except *Protonotarius*; no rictal bristles. *Swamp Warblers.* Genera: *Protonotarius*, *Helminthophaga*, *Helmitherus* . . *Vermivoreæ.*

Bill notched. Rictus with distinct bristles, reaching nearly to the nostrils. *Wood Warblers.* Genera: *Perisoglossa*, *Dendroica* . . . . . *Sylvicoleæ.*

Geothlypinæ. Bill much as in *Sylvicolinæ*; with distinct notch; slender, or stout, the culmen gently curved; the commissure nearly straight. Legs much developed; tarsi longer than the skull. Bristles of rictus short, but appreciable. *Ground Warblers.*

Wings pointed; longer than the nearly even tail. Genera: *Seiurus*, *Oporornis* . . . . . *Seuireæ.*

Wings much rounded; shorter than the graduated tail. Genus: *Geothlypis* . . . . . *Geothlypeæ.*

Icterianæ. Bill without notch, or rictal bristles. Culmen and commissure much curved. Wings much rounded; shorter than the tail.

Bill very high. Tail graduated. Outer toe deeply cleft. Genera: *Icteria*, *Granatellus* . . . . . *Ictericæ.*

Bill slender. Tail nearly even. Outer toe adherent for basal half. Genus: *Teretristis* . . . . . *Teretristeæ.*

Bill depressed; rictus with long bristles.

Setophaginæ. Bill much depressed; considerably broader than high; the tip more or less hooked, with distinct notch. Bristles lengthened, reaching half way or more from the nostrils to tip of bill.

The synopsis of the sections and generic characters of the *Setophaginæ* will be found further on under the head of that subfamily.

As already remarked, the species of *Sylvicolidæ*, as here restricted, are all of very small size, scarcely exceeding six inches in length, usually less; *Icteria* alone is larger.

SUBFAMILY SYLVICOLINÆ.

MNIOTILTA, VIEILL.

Mniotilta, VIEILLOT, Analyse, 1816, 45. (Type *Figuier varié*, BUFF. (*Motacilla varia*, LINN.)).

Mniotilta varia.

Motacilla varia, LINN. S. N. I, 1766, 333.—*Certhia varia*, VIEILLOT; AUDUBON.—*Mniotilta varia*, VIEILLOT, Gal. Ois. I, 1834, 276, pl. 169. —AUD., GOSSE.—BAIRD, Birds N. Am. 1858, 235.—SCLATER, P. Z. S. 1858, 298 (Oaxaca, Xalapa); 1859, 363 (Xalapa); 1855, 143 (Bogota); 1856, 291 (Cordova); 1864, 172 (City of Mex.).—IB. Catal. 1861, 25, no. 162.—SCL. & SALV. Ibis, 1859, 10 (Guatemala).—NEWTON, Ibis, 1859, 143 (Santa Cruz; winter).—CAB. Jour. III, 475 (Cuba; winter).—BRYANT, Pr. Bost. Soc. 1859 (Bahamas; April 20).—GOSSE, Birds Jam. 134 (Jamaica; winter).—JONES, Nat. Bermuda, 1859, 29 (October).—CAB. Jour. 1860, 328 (Costa Rica).—LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama R. R.; winter).—GUNDL. Cab. Journ. 1861, 326 (Cuba; very common).

Certhia maculata, WILS.—*Mniotilta borealis*, NUTT.

Mniotilta varia, var. *longirostris*, BAIRD, Birds N. Am. 1858, xxxi, no. 167.—IB. Catal. in 8vo. 1859, no. 167*.

Figures: AUD. Orn. Biog. V, pl. 90; Birds Am. II, pl. 114.—WILSON, Am. Orn. III, pl. xix.

Hab. Eastern province of North America, and north to Fort Simpson. Both coasts of Mexico (as far north as Mazatlan, on west side), and southward to Bogota. Whole West Indies and Bermuda.

Localities quoted. Bahamas; Bermuda; Cuba; Jamaica; Santa Cruz; W. Indies; Cordova, Xalapa, Oaxaca, Mex.; Guatemala; Panama R. R.; Bogota.

I have nothing especial to add to the account of this species contained in the "Birds of North America," except to say that the differences there referred to in the length of the bill are seen in the more recent specimens, and belong more particularly to southern skins. Dr. Brewer considers the eggs of the southern bird so different as to warrant their specific separation. I find it, however, very difficult to express the differences other than as consisting in longer bill and less degree of black beneath.

This species is remarkable as occurring at Mazatlan and Colima, and not in California or the Rocky Mountains.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,622	997	..	Fort Simpson.	May 28, '61.	B. R. Ross.	.....
18,685	..	♂	Portsmouth, N. H.	...	Dr. E. Coues.	.....
4,680	..	..	Mo. of Vermilion.	May 5.	Lt. Warren.	Dr. Hayden.
68	..	♂	Carlisle, Pa.	May, 1839.	S. F. Baird.	.....
10,105	..	..	South Illinois.	April.	R. Kennicott.	.....
32,227	..	♂	Liberty County, Ga.	...	Prof. Leconte.	.....
8,673	..	..	Cape Florida.	Sept. 25, '57.	G. Wurdemann.	.....
22,145	..	♀	Spanishtown, Jam.	...	W. T. March.	.....
24,356	26	♂	"	Nov. 4, '61.	"	.....
23,308	..	♂	Trelawney, Jam.	Jan. 13, '59.	Dr. Sclater.	W. Osburn.
..	..	..	Santa Cruz.	Mar. 21, '57.	Alfred Newton.	.....
23,516	..	♂	Monte Verde, Cuba.	Jan. 17, '61.	Chas. Wright.	.....
34,019	126	..	Mazatlan.	...	A. J. Grayson.	.....
29,357	122	♂	Colima, Mex.	Feb. 1863.	John Xantus.	.....
30,666	179	..	Retaleuleu, Guat.	Sept. 1862.	O. Salvin.	Salvin & Godman.
30,667	177	..	Duenas, Guat.	...	"	.....
34,102	..	♂	Punta Arenas, C. R.	Jan. 1864.	Capt. Dow.	.....
33,268	61	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
34,646	..	♂	Angostura, C. R.	Mar. 9, '64.	J. Carmiol.	.....

PARULA, Bon.

Chloris, Boie, Isis, 1826, 972 (not of Mœhring, 1752). (Type *Parus americanus*, L.)

Sylvicola, Swainson, Zool. Jour. III, July, 1827, 160 (not of Humphrey, Mus. Calonnianum, 1797, 60). (Same type.)

Parula, Bon., Geog. Comp. Cat. 1838. (Same type.)

Compsothlypis, Cab. Mus. Hein. 1850–51, 20. (Same type.) (*Parula* rejected as contrary to the Linnæan canons of nomenclature.)

If Mœhring's genera are rejected as made prior to the establishment of the Linnæan binomial nomenclature, and by a non-binomial author, there is, perhaps, no reason why Boie's name *Chloris* should not be adopted for this group. I, however, leave the matter in abeyance for the present.

The following synopsis may aid in determining the species of *Parula*:—

A. Color above plumbeous blue, with a triangular interscapular patch of olive; beneath yellow anteriorly. Lateral tail feathers with a square patch of white on inner webs.

Yellow reaching only to breast. Feathers of jugulum clouded with dark brownish. Eyelids only white. White patches on three lateral tail feathers. Two white bands on wings . . . . . *americana.*

Yellow extending over the belly. Jugulum only slightly varied with ochraceous. No white on side of head. white patches on two lateral tail feathers. Two white bands on wings. Forehead and lores black . . . *pityayumi.*

Similar to last, but without white on the wings. Jugulum not ochraceous . . . . . *inornata.*

B. Above ashy. No white on wings and tail, except on inner margins of lateral tail feathers. Beneath yellow or red anteriorly.

From chin to breast yellow, with a well defined brown crescent on throat. Whole back olivaceous. A stripe over eye, and eyelids white . . . . . *superciliosa.*

From chin to jugulum plain orange-red. A crescentic saddle of black on the back. No white on side of head. Lores black . . . . . *gutturalis.*

Parula americana.

Parus americanus, Linn. S. N. 10th ed. I, 1758, 190.—*Motacilla am.* Gmelin.—*Sylvia am.* Lath., Aud.—*Sylvicola am.* Rich., Aud.—Jones, Nat. in Bermuda, 1839, 59.—*Parula am.* Bon. List Birds N. A. 1838.—Gosse, Birds Jam. 1847, 154 (Jamaica).—Baird, Birds N. Am. 1858, 238.—Sclater, P. Z. S. 1857, 202 (Xalapa).—Ib. Ibis, 1859, 10 (Guatemala).—Ib. Catal. 1861, 26, 163.—Newton, Ibis, 1859, 143 (Santa Cruz; winter).—Cassin, Pr. A. N. S. 1860, 376 (St. Thomas).—Gundlach, Cub. Jour. 1861, 326 (Cuba; very common).—*Compsothlypis am.* Cab. Mus. Hein. 1850, 20.—Ib. Jour. III, 1855, 476 (Cuba).

Ficedula ludoviciana, Brisson.—*Motacilla lud.* Gm.—*Motacilla eques*, Bodd.—*Sylvia torquata*, Vieill.—*Thryothorus torq.* Stephens.—*Sylvia pusilla*, Wils.—*Sylvicola pus.* Swains.

Figures: Aud. Orn. Biog. I, pl. xv.—Ib. B. A. II, pl. 91.—Vieill. Ois. Am. II, pl. 99.—Wils. Am. Orn. IV, pl. xxviii.—Buffon, pl. enl. 731, fig. 1; 709, fig. 1.

Hab. Eastern province of United States, north to the Lakes, west to the Missouri Valley; in winter south to Guatemala (not seen on the west coast of Mexico). West Indies; Bahamas; Cuba; Jamaica; St. Croix; St. Thomas.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,301	..	..	Halifax, N. S.	...	W. G. Winton.	.....
2,219	..	♂	Carlisle.	May 3, '45.	S. F. Baird.	.....
338	..	♀	"	May 1, '41.	"	.....
8,647	..	..	Cape Florida.	Sept. 27, '57.	G. Wurdemann.	.....
4,671	..	..	Mo. of Platte River.	April 27, '56.	Lt. Warren.	Dr. Hayden.
29,629	..	♀	Fermina, Cuba.	Feb. 18.	C. Wright.	.....
24,341	35	♂	Spanishtown, Jam.	Nov. 6, '61.	W. T. March.	.....
..	..	..	Santa Cruz.	Mar. 24, '57.	A. & E. Newton.	.....
30,669	132	..	Coban, Vera Paz.	Nov. 18, '59.	O. Salvin.	Salvin & Godman.

Parula pitiayumi.

Sylvia pitiayumi, VIEILLOT, Nouv. Dict. II, 1816, 276.—*Compsothlypis pit.* CAB. Mus. Hein. 21.—*Parula pit.* SCLATER, Cat. 26, no. 165.

Sylvia venusta, TEMM. Pl. Col. 293, fig. 1.—D'ORB. Voy. IV, 1844; Ois. 218.—*Sylricola ven.* BURM. Uebers. III, 116.

Sylvia plumbea, SWAINS. Zool. Ill. II, 1821–2, pl. 139.

Parula brasiliana, BON. Consp. 1850, 310.—SCLATER, P. Z. S. 1859, 137; 1860, 273.—*Compsothlypis bras.* SCLATER, P. Z. S. 1855, 143 (Bogota).

Hab. South America, generally to Paraguay; Ecuador; Bogota; Trinidad.

(20,972.) Above plumbeous-blue, with a patch of olive-green in middle of back, as in *P. americana*. Beneath rich yellow; slightly ochraceous on the jugulum; the inside of wings, anal region, and crissum snowy white. Frontal band and loral region black; ears dusky. Two patches of white on the wing. A square patch of white on inner web of outer tail feather near the end; a smaller one on the next feather. Females scarcely different, though duller and smaller.

Length, 4.26; wing, 2.15; tail, 2.00.

This species differs from *P. americana*, to which it is nearly allied, by the greater extension backwards of a deeper yellow, and absence of the decided brown mark of jugulum; the black frontal and loral patch; less amount of white on wing, and the spots on tail not extending to the third feather.

A specimen from Trinidad, belonging to Mr. Newton, has the breast and jugulum more ochraceous than any other before me.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,972	56	♀	Parana River.	Mar., 1860.	Capt. Page.	C. Wood.
16,335	99	♀	Brazil.	Aug. 1859.	"	"
1,819	..	..	"	...	S. F. Baird.	.....
32,698	40,430	♂	"	...	Verreaux.	.....
24,987	..	..	Bogota.	...	L. de Geofroy.	.....
30,612	..	..	Trinidad.	...	M. Galody.	.....

Parula inornata.

Parula inornata, BAIRD.

Parula brasiliana, SCLATER & SALV. Ibis, 1860, 397 (Coban, Guatemala). Not of LICHT.

Hab. Guatemala and Costa Rica.

By the kindness of Mr. Salvin I have been enabled to examine a specimen of the supposed *P. pitiayumi*, from Guatemala (no. 187 (1,488) Salvin's coll., Choctun, Vera Paz, Jan. 1860), and find that it differs sufficiently from the South American bird to entitle it to a specific name. Mr. Salvin's specimen is probably a female; but compared with females of the old species it is decidedly smaller, the tail especially, and with its feathers narrower. The tarsi are shorter. The under parts are paler yellow, with very little or no ochraceous on the breast. The edge of the wing is blue, not white, and the wing lacks the two sharply defined white bands across the coverts—their presence being only indicated by a scarcely appreciable lightening of the blue in the region of the bands.

Total length, 4.20; wing, 1.95; tail, 1.75; width of outer feather, .20; length of bill from forehead, .45, from nostril, .29; tarsus, .62; middle toe and claw, .48; hind toe and claw, .37.

The comparison of this specimen has been made with an extensive series of *P. pitiayumi*, from Bogota, Trinidad, Brazil, and Paraguay.

NOTE.—Since writing the preceding article, specimens received from Mr. Carmiol fully substantiate the distinctness of the Central American Bird. One of these shows a little whitish on the edges of the greater coverts, but none on the median.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	187 / 1,488	..	Choctun, Vera Paz.	Jan. 1860.	Cab. O. Salvin.	.....
34,649	..	♀	Angustura, C. R.	Mar. 8, '64.	J. Carmiol.	.....
35,221	..	♂	Dota, C. R.	Aug. 27, '64.	"	.....
35,222	..	♀	" "	"	"	.....

Parula superciliosa.

Conirostrum superciliosum, HARTLAUB, R. Z. 1844, 215 (Guatemala).—*Parula superciliosa*, SCLATER, P. Z. S. 1858, 299.—IB. Catal. 1861, 26, no. 164.—SCLATER & SALVIN, Ibis, I, 1859, 10.

Parula mexicana, BON. Consp. 1850, 310.—*Compsothlypis mexicana*, CABANIS, Mus. Hein. 1850, 21.

Hab. Mexico (La Parada, Oaxaca, Orizaba); Guatemala.

Upper parts ashy; interscapulum and whole back, except upper tail coverts, olive-green; this color tinging the lesser wing coverts. Beneath, from chin

to breast, yellow; posterior to this whitish, the sides tinged with ashy. A brown or chestnut crescent across the throat. Line from bill over the eye along side of head, with eyelids, white. No white markings on wing and tail.

Length, 4.50; wing, 2.45; tail, 2.20; tarsus, .67.

I have seen no skins marked female, but what I consider to be such differ only in a smaller patch of brown on the throat.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,155	..	..	Mexico.	...	J. Gould.	.....
32,696	40,800	♂	" [region.)	...	Verreaux.	.....
32,465	1,159	..	Orizaba. (Alpine	...	Prof. Sumichrast.	.....

Parula gutturalis.

Compsothlypis gutturalis, CAB. Jour. Orn. 1860, 329 (Costa Rica).

(30,499.) Above ashy plumbeous; the whole interscapulum crossed by a black crescent, the convexity posterior and extending a short distance down the back. Beneath, from chin to breast, bright orange-red; rest of under parts, including lining of wings, white; the sides and concealed centres of the crissum light plumbeous. Lores and cheeks below line of the eye blackish. Quills blackish; tail feathers not so dark, edged externally with the plumbeous of the upper parts. The inner webs of lateral tail feathers narrowly edged with white. No other white markings whatever on the wings and tail, and none appreciable on the side of head. Bill black, yellow at the base beneath; legs plumbeous brown.

Total length, 4.80; wing, 2.55; tail, 2.20; length along culmen, .50; from nostril, .33; tarsus, .72; middle toe and claw, .56; hind toe and claw, .40; claw alone, .22.

This—one of the most beautiful of the American Warblers—is so peculiar in coloration as not to require any comparison. It resembles *Dendroica blackburnia* in the coloration of the throat, but is otherwise very different. The specimen upon which the species was based by Dr. Cabanis, was probably a female, or else in autumnal dress.

It is not at all impossible that anatomical examination may show this species to be more nearly related to the *Cærebidæ* than to the *Sylvicolidæ*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,494	14	..	Costa Rica. [C. R.	...	Dr. Frantzius.	J. Carmiol.
35,220	..	♂	Rancho Redondo,	Sept. 17, '64	J. Carmiol.	"

PROTONOTARIA, Baird.

Protonotaria, Baird, Birds N. Am. 1858, 239. (Type *Motacilla citrea*, Bodd.)

Protonotaria citrea.

Motacilla citrea, Bodd. Tabl. 1783 (Pl. enl. 704, fig. 2).—*Protonotaria citrea*, Baird, Birds N. Am. 1858, 239.—Sclater, Catal. 1861, 26, no. 166.—Gundl. Cub. Jour. 1861, 324 (Cuba; very rare).—*Helminthophaga citrea*, Cab. Jour. 1861, 85 (Costa Rica).

Motacilla protonotarius, Gm.—*Sylvia prot.* Lath.—Vieill. Ois. Am. Sept. II, pl. lxxxiii.—Wilson, Am. Orn. III, pl. xxiv, fig. 2.—Aud. Orn. Biog. II, pl. iii.—*Vermivora prot.* Bon.—*Helinaia prot.* Aud.—*Helmitherus prot.* Bon.—*Compsothlypis prot.* Cab. Jour.

Motacilla auricollis, Gmel. I, 1788, 984.—*Sylvia aur.* Lath., etc. (based on *Le Grand Figuier du Canada*, Brisson, Ois. III, 1760, 508, pl. xxvi, fig. 1). Female.—*Sylvicola aur.* Nutt. Man. I, 1840, 431.

Hab. Eastern province of U. S. (southern region); Cuba, Costa Rica, and Panama R. R. Not recorded from Mexico or Guatemala. Accidental in New Brunswick (*G. A. Boardman* in letter).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,112	..	..	S. Illinois.	May 9.	R. Kennicott.	.....
7,516	..	..	Independence, Mo.	1857.	W. M. Magraw.	Dr. J. G. Cooper.
18,681	..	..	Neosho Falls, Kans.	...	B. F. Goss.	.....
12,146	..	..	Cherokee Nation.	June 25.	Dr. Woodhouse.	.....
34,102	..	♂	Punta Arenas, C. R.	Jan. 1864.	Capt. J. M. Dow.	.....
..	..	..	Panama.	1863.	Cab. Lawrence.	.....

(34,102.) Iris dark chestnut.

HELMINTHOPHAGA, Cabanis.

Helminthophaga, Cab. Mus. Hein. I, 1850–1, 20. (Type *Sylvia ruficapilla*, Wils.)

The discovery, since the article on *Helminthophaga* in "Birds N. Am." was written, of two new species, allied to *ruficapilla*, in having a concealed brown patch in the crown, renders a new diagnosis desirable of section B.

B. Tail without any conspicuous white patch, and wings without light bands.

Concealed patch in crown orange-brown. Color uniformly olive-green above and yellowish beneath . . . . *celata.*

Concealed patch in crown chestnut-brown.

Olive-green above; the head and neck ashy. Beneath, including lining of wings, bright yellow. Wing and tail feathers edged with olive . . . . . *ruficapilla.*

Cinereous above; the rump and crissum yellowish. Beneath, with lining of wings, dirty white, tinged

with yellow on throat and breast. Wing and tail feathers edged with ashy . . . . . *virginiæ*.

Cinereous above; whitish beneath. Upper tail coverts chestnut-brown, as in the vertex. A dull patch of white on outer tail feather . . . . . *luciæ*.

No concealed patch in the crown.

Olive above; the head and neck ashy. Beneath, with lining of wing, white. A dull patch of white on outer tail feather . . . . . *peregrina*.

From an examination of the recorded localities of *Helminthophaga* it will be seen that, of the eight known species, one (*celata*) belongs to the western and middle provinces—straggling into the eastern, especially along its borders; two (*virginiæ* and *luciæ*) are confined to the southern region of the middle province; while the other five belong exclusively to the eastern province, most of them rather southern in their range. Of these five, *pinus* and *ruficapilla* have no West Indian localities given; the others, *chrysoptera*, *bachmani*, and *peregrina* are very rare there, and found only in Cuba. Their distribution in Mexico and Central America is varied; but they hardly belong at all to western Mexico. The most notable feature in the distribution of both *Helminthophaga* and *Helmitherus*, is their not occurring in the West Indies at all except in Cuba, which may be merely a stepping stone in the migration between Florida and Central America, by way of Yucatan.

Helminthophaga pinus.

Certhia pinus, LINN. Syst. Nat. I, 1766, 187.—*Sylvia pinus*, LATH., VIEILL. (not of WILSON).—*Helminthophaga pinus*, BAIRD, Birds N. Am. 1858, 254.—SCLATER & SALVIN, Ibis, I, 1859, 11 (Guatemala).—SCLATER, Catal. 1861, 28, no. 176.

Sylvia solitaria, WILSON, Am. Orn. II, pl. xv.—AUD. Orn. Biog. I, pl. xx.—*Sylvicola sol.* RICH.—*Vermivora sol.* SW.—*Helinaia sol.* AUD. B. A. II, pl. cxi.—*Helmitherus sol.* BON.—SCLATER, P. Z. S. 1856, 291 (Cordova).—*Helminthophaga sol.* CAB.

Hab. Eastern province of U. S. (rather southern): Eastern Mexico; Guatemala. *Recorded localities:* Cordova, Mex.; Coban, Guat. Not noted from West Indies.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,229	..	♂	Carlisle, Pa.	May 6, '45.	S. F. Baird.	S. F. Baird.
6,983	61	♂	St. Louis, Mo.	May 12, '57.	Lt. Bryan.	W. S. Wood.
12,195	..	♀	Creek Nation.	...	Capt. Sitgreaves.	Dr. Woodhouse.
30,670	3,817	..	Coban, Vera Paz.	1862.	O. Salvin.	.....
32,708	32,620	♂	Mexico.	...	Verreaux.	.....

Helminthophaga chrysoptera.

Motacilla chrysoptera, LINN. S. Nat. I, 1766, 333.—*Sylvia chr.* LATH.—WILS. Am. Orn. II, pl. xv, fig. 5.—BON.—*Sylvicola chr.* BON.—*Helinaia chr.* AUD. B. A. II, pl. cvii.—*Helmitherus chr.* BON.—SCLATER P. Z. S. 1855, 143 (Bogota).—*Helminthophaga chrysoptera*, CAB. Mus. Hein; Journ. f. Orn. 1860, 328 (Costa Rica).—BAIRD, Birds N. Am. 1858, 255.—SCLATER & SALVIN, Ibis, II, 1860, 397 (Choctum, Guatemala).—SCL. Catal. 1861, 28, no. 177.—LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 293 (Panama).—GUNDL. Cab. Journ. 1861, 326 (Cuba, rare).

Motacilla flavifrons, GMELIN.—*Sylvia flavifrons*, LATH.

Hab. Eastern province of U. S.: Cuba (rare); Guatemala; Costa Rica; Panama; Bogota. Recorded in West Indies—Cuba only; not from Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,365	..	♂	Carlisle, Pa.	July 8, 1845.	S. F. Baird.	S. F. Baird.
A	..	..	Racine, Wis.	...	Dr. R. P. Hoy.	.....
10,156	..	♂	Union County, Ill.	May 11.	R. Kennicott.	R. Kennicott.
6,982	..	♂	St. Louis, Mo.	May 13, '57.	Lt. Bryan.	W. S. Wood.
10,251	..	..	Liberty County, Ga.	...	Prof. Jos. Leconte.	.....
30,672	..	♀	Coban, Guat.	1862.	O. Salvin.	Salvin & Godm.
30,671	..	♂	Choctum, Guat.	Jan. 1860.	"	.....
32,702	43,030	..	Bogota.	...	Verreaux.	.....

(A.) Nest eggs.

Helminthophaga bachmani.

Sylvia bachmani, AUD. Orn. Biog. II, 1834, 483, pl. 183.—*Sylvicola b.* RICH.—*Vermivora b.* BON.—*Helinaia b.* AUD. Syn. Birds Am. II, 1841, 93, pl. cviii.—LEMBEYE, Av. Cuba, 1850, 36, pl. vi, fig. 1.—*Helmitherus b.* BON.—*Helminthophaga b.* CAB. Jour. III, 1855, 475 (Cuba, in winter).—BAIRD. Birds N. Am. 1858, 255.—GUNDLACH, Cab. Jour. 1861, 326 (Cuba, rare).

Hab. Coast of S. Carolina and Georgia; Cuba in winter.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,903	..	♂	Charleston, S. C.	...	S. F. Baird.	J. J. Audubon.

Helminthophaga ruficapilla.

Sylvia ruficapilla, WILS. Am. Orn. III, 1811, 120, pl. xxvii, fig. 3.—AUD. Orn. Biog. I, 1832, 450, pl. 89.—*Helminthophaga ruficapilla*, BAIRD, Birds N. Am. 1858, 256.—SCLATER, P. Z. S. 1859, 373 (Xalapa).—IB. Catal. 1861, 29, no. 178.

Sylvia rubricapilla, WILS. Am. Orn. VI, 1812, 15, General Index.—NUTT., BON.—*Sylvicola rub.* RICH.—*Vermivora rub.* BON.—REINHARDT, Vid.

Med. for 1853, 1854, 82 (Greenland).—Brewer, Pr. Bost. Soc. N. H. VI, 1856, 4 (nest and eggs).—*Helinaia rub.* Aud. B. A. II, pl. 113.—*Helmitherus rub.* Bon.—Scl. P. Z. S. 1856, 291 (Cordova); 1859, 363 (Xalapa).—*Helminthophaga rub.* Cab.—Sclater, P. Z. S. 1858, 295 (Oaxaca; Feb. and Aug.).—*Mniotilta rub.* Reinhardt, Ibis, 1861, 6 (Greenland).

Sylvia leucogastra, Shaw, Gen. Zool. X, II, 1817, 622.

"*Sylvia nashvillei*," Vieillot.—Gray.—*Sylvia mexicana*, Holböll.

Hab. Eastern province of N. America, north to line of British America; Greenland; south to Mexico; not in West Indies. Recorded from Xalapa, Cordova, Orizaba, and Oaxaca, Mex.

Smith-sonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
28,939	..	..	Nova Scotia.	...	W. G. Winton.	W. G. Winton.
2,150	..	♂	Carlisle, Pa.	April 26,'45.	S. F. Baird.	S. F. Baird.
2,237	..	♀	"	May 6, 1845.	"	"
30,281	22	♀	Lake of the Woods.	May 30, '60.	R. Kennicott.	R. Kennicott.
30,293	37	..	Ft. Stockton, Tex.	May 6, 1860.	P. Duffy.	P. Duffy.
12,707	29,935	♀	Mexico.	...	Verreaux.	.....
12,703	29,934	♂	"	...	"	.....
29,205	..	..	Orizaba, Mex.	...	Prof. Sumichrast.	.....

Helminthophaga celata.

Sylvia celata, Say, Long's Exp. R. Mts. I, 1823, 169.—Bon. Am. Orn. I, pl. v, fig. 2.—Aud. Orn. Biog. II, pl. 178.—*Sylvicola cel.* Rich.—*Vermivora cel.* Jard.—*Helinaia cel.* Aud. B. A. II, pl. 112.—*Helmitherus cel.* Bon.—Sclater, P. Z. S. 1857, 212 (Orizaba).—*Helminthophaga cel.* Baird, Birds N. Am. 1858, 257.—Sclater, P. Z. S. 1858, 298 (Oaxaca; December); 1859, 373; 1862, 19 (La Parada).—Cooper & Suckley, P. R. R. XII, II, 1859, 178.—Lord, Pr. R. Art. Inst. Woolwich, IV, 1864, 115 (N. W. Boundary).

Hab. Middle and western provinces of N. America: Youkon and McKenzie River dist. Very rare in the eastern Province of U. S.; Cape St. Lucas; western Mexico in winter.

On comparing extensive series of specimens from the Pacific coast (including Cape St. Lucas), and those from the interior of North America, including Arizona, Utah, Rocky Mountains, Tamaulipas, and the Hudson Bay territories, I find that the former are of a much brighter and clearer yellowish beneath and olivaceous above than the latter. In all these there is much gray mixed with the yellowish tints, clouding and obscuring them—sometimes very considerably. The concealed orange-brown patch of the crown is also more restricted in extent. These differences correspond with those of maturity of plumage, but even winter and young specimens from the Pacific coast are more brightly colored than the others in spring.

Specimens from the Youkon seem to show traces of hybridity with *peregrina*, one skin especially (27,326) in which the cheeks and forehead are as pure gray as in *peregrina*, while all the other characters are those of *celata*. This same apparent tendency to hybridism in Youkon specimens is seen in other species, as between *Junco hyemalis* and *oregonus*, etc., and may be explained by the fact of this region being in the boundary line of the breeding grounds of these closely allied representative species.

A specimen of *celata*, from Georgia, shows no trace of orange in the crown, and is much darker in color, and with larger bill than in western ones.

Mr. Audubon speaks of the *H. celata* as being common and generally distributed through the Eastern States, and breeding abundantly in Maine, New Brunswick, etc. I have myself never seen or heard of any specimens from east of the Mississippi Valley, excepting a few taken in Georgia and Florida, and near Philadelphia, and these may belong to a different species. The Institution possesses one specimen from Dane Co., Wisconsin.

Specimens are in the collection from many localities in the Pacific region of the United States up to the northern boundary, and east to the Rocky Mts.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,221	1,214	..	Ft. Youkon.	June 10, '61.	R. Kennicott.	R. Kennicott.
27,325	1,300	♀	"	June 15, '61.	"	.....
19,241	507	♀	Ft. Resolution.	May 22, '60.	"	.....
27,228	1,301	♀	Fort Simpson.	...	B. R. Ross.	B. R. Ross.
7,923	..	♀	Dane County, Wis.	...	Th. Kumlien.	.....
12,852	..	..	Georgia. [Lucas.	...	J. Ackhurst.	.....
20,442	3,408	..	San Jose, Cape St.	Nov. 25, '59.	J. Xantus.	J. Xantus.
32,706	40,774	♀	Mexico.	...	Verreaux.	.....

(27,325.) With eggs. (12,852.) This and the last the only specimens in the collection from east of the Missouri River.

Helminthophaga virginiæ.

Helminthophaga virginiæ, BAIRD, Birds N. Am. under explanation of plates, 1860, xi, pl. 79, fig. 1 (Fort Burgwyn, N. M.).

Hab. Southern Rocky Mts. (middle province U. S.).

Similar to *H. ruficapilla*. Top and sides of head, back, and wings light ashy plumbeous, with an almost imperceptible wash of olivaceous green; quills and tail feathers brown, edged with pure ashy plumbeous, the latter indistinctly and narrowly margined with whitish internally and at the end. Rump, with upper and lower tail covert bright yellow, in vivid contrast with the rest of the body. Crown with a concealed patch of orange-brown. Rest of under parts brownish-white, with indications of yellow from chin to breast,

perhaps entirely yellow there when mature. Inside of wings and axillars whitish. A white ring round the eye. Bill and legs dusky.

Length, 5.00; extent, 7.25; wing, 2.50 when fresh. Dried skin: length, 4.90; wing, 2.50; tail, 2.20; tarsus, .67.

Of this interesting species, discovered by Dr. Anderson, and named after Mrs. Anderson, but a single specimen was known to collectors, until Dr. Coues obtained it at Fort Whipple, near Prescott, in Arizona (Aug. 15, 1864).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,719	..	..	Ft. Burgwyn, N. M.	...	Dr. W. W. Anderson.	Dr. W. W. Anderson.
36,977	592	..	Ft. Whipple, Ariz.	Aug. 15, '64.	Dr. E. Coues, [son. [U. S. A.	Dr. Coues. [son.

(10,719.) The type of species.

Helminthophaga luciæ.

Helminthophaga luciæ, COOPER, Pr. Cal. Acad. July, 1861, 120 (Fort Mohave).

Hab. Fort Mohave, Colorado River (middle province U. S.).

General form and size that of *H. ruficapilla*. Above light cinereous; beneath white, having a soiled, very pale buff, almost white tinge on the throat, breast, and flanks. A patch on the vertex, as in *H. ruficapilla*, and the upper tail coverts dark chestnut-brown. Lores to nostrils, and region round the eye, like the throat, in rather decided contrast to the ash of the crown. Quills and tail feathers brown, narrowly edged externally with gray. An obsolete terminal white patch on the inner web of the outer feather; this web in most of the other tail feathers likewise narrowly edged with white. Axillars and inner face of wings white. Iris brown. Tarsi blue.

Length, in life, 4.40; extent, 6.90; wing, 2.40. Of skin, 3.90; wing, 2.33; tail, 1.86; tarsus, .64; middle toe and claw, .50; bill above, .35; gape, .50.

Of this species several specimens were collected at Fort Mohave, on the Colorado River, by Dr. Cooper. The species is dedicated to Miss Lucy H. Baird.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
31,892	..	..	Ft. Mohave, Cal.	...	Dr. J. G. Cooper.	.....

(31,892.) A type of the species.

Helminthophaga peregrina.

Sylvia peregrina, WILS. Am. Orn. IV, 1811, 83, pl. XXV, fig. 2.—AUD. Orn. Biog. II, pl. 154.—*Sylvicola per.* RICH.—*Vermivora per.* BON.—*Helinaia per.* AUD. B. A. II, pl. 110.—*Helmitherus per.* BON.—

Helminthophaga per. CAB. Mus. Hein.—IB. Jour. Orn. 1861, 85 (Costa Rica).—BAIRD, Birds N. Am. 1858, 258.—SCLATER & SALVIN, Ibis, 1860, 31 (Guatemala).—SCLATER, P. Z. S. 1859, 373 (Oaxaca); Catal. 1861, 29, no. 180.—LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba, very rare).

Sylvia tennessæi, VIEILLOT, Encycl. Méth. II, 1823, 452.

?*Sylvia missuriensis*, MAX. Cab. Jour. VI, 1858, 117.

Hab. Eastern province of N. America: North to Fort Simpson, H. B. T.; Mexico; Oaxaca ? Guatemala; Costa Rica; Panama R. R. Very rare in Cuba.

Autumnal specimens and young birds are sometimes so strongly tinged with greenish-yellow as to be scarcely distinguishable from *H. celata*. The wing is, however, always longer, and the obscure whitish patch on the inner edge of the exterior tail feather, near its tip, is almost always appreciable. In *celata* this edge is very narrowly and uniformly margined with whitish.

A young bird of the year, from Fort Simpson (27,228), has two distinct greenish-white bands on the wings, and the forehead and cheeks greenish-yellow. A corresponding age of *H. celata* has the wing bands more reddish-brown, the wings shorter, and no white patch on the outer tail feather.

It is possible that Mr. Sclater is mistaken in quoting this species from Oaxaca, the only Mexican locality mentioned by authors.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,623	..	♂	Moose Factory, H. B.	June 2, '60.	C. Drexler.	C. Drexler.
20,624	..	..	Ft. George, H. B.	July 11, '60.	"	"
30,639	..	..	Maine.	1863.	W. F. Hall.	W. F. Hall.
22,627	1,010	..	Ft. Simpson.	May 9, 1861.	B. R. Ross.	.....
19,495	728	♂	Ft. Resolution.	June 17, '60.	R. Kennicott.	R. Kennicott.
31,421	249	♀	Ft. Rae.	...	L. Clarke.	.....
1,879	..	♂	Upper Missouri, Dac.	1843.	S. F. Baird.	J. G. Bell.
790	..	♂	Carlisle, Pa.	Oct. 10, '42.	"	S. F. Baird.
412	..	♀	"	May 21, '41.	"	"
10,157	..	♂	Cairo, Ill.	April.	R. Kennicott.	R. Kennicott.
30,673	219	..	Coban, Guat. [Rica.	Nov. 1859.	O. Salvin.	.....
33,269	5	♂	Dota Mts., Costa	Jan. 24, '64.	J. Carniol.	.....
33,270	..	..	San Jose.	Winter.	"	.....

HELMITHERUS, RAF.

Helmitherus, RAF. Jour. de Phys. vol. 88, 1819, 417. (Type *Motacilla vermivora*, LATH.)

Vermivora, SWAINSON, Zool. Jour. IV, 1827, 170.

Helinaia, AUD. Syn. 1839, 66. (Type *Sylvia swainsoni*, AUD.)

Helmitherus vermivorus.

Motacilla vermivora, GMEL. Syst. Nat. I, 1788, 951.—?*Sylvia vermivora*, LATH. Ind. Orn. II, 1790, 499.—WILS. III, pl. xxiv, fig. 4.—AUD.

Orn. Biog. I, pl. xxxiv.—*Sylvicola vermivora*, Rich.—*Helinaia vermivora*, Aud. B. A. II, pl. cv.—Lembeye, Av. Cuba, 1850, 35, pl. vi, fig. 4.—*Helmitherus vermivorus*, Bon.; Cab.; Baird, Birds N. Am. 1858, 252.—Sclater, P. Z. S. 1859, 363 (Xalapa).—Ib. Catal. 1861, 28, no. 175.—Sclater & Salvin, Ibis, I, 1859, 11 (Guatemala); Cab. Jour. 1860, 329 (Costa Rica); Ib. 1856 (Cuba).—Gundlach, Cab. Jour. 1861, 326 (Cuba; somewhat rare).

Vermivora pennsylvanica, Bon., Gosse, B. Jamaica, 1847, 150.

Helmitherus migratorius, Raf. J. de Phys. 88, 1819, 417.—Hartlaub.

Vermivora fulvicapilla, Swainson, Birds, II, 1837, 245.

Hab. Eastern province of U. States (rather southern); southeastern Mexico; Guatemala; Cuba.

Specimens are in the collection from various points in the eastern United States, as far north as Carlisle, Pa., and as far west as Independence, Mo.; also from—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,623	..	♂	Fermina, Cuba.	Feb. 17.	C. Wright.	C. Wright.
29,622	..	..	"	"	"	.....
30,668	3,071	..	Coban, Vera Paz.	Nov. 1859.	O. Salvin.	.....
33,286	..	..	San Jose, C. R.	...	J. Carmiol.	.....
33,285	..	..	"	...	"	.....

Helmitherus swainsoni.

Sylvia swainsoni, Aud. Orn. Biog. II, 1834, 563, pl. cxcviii.—*Sylvicola sw.* Rich.—*Vermivora sw.* Bon.—*Helinaia sw.* Aud. B. A. II, 1841, pl. civ (type of genus).—*Helmitherus sw.* Bon.; Cab.; Baird, Birds N. Am. 1858, 252.

Coast of South Carolina and Georgia; Cuba (very rare).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,901	..	..	Charleston, S. C.	...	S. F. Baird.	J. J. Audubon.
32,241	..	♂	Liberty County, Ga	...	Prof. Leconte.	.....
..	..	..	Cuba.	...	Cab. Gundlach.	.....

PERISSOGLOSSA, Baird.

Perissoglossa, Baird. (Type *Motacilla tigrina*, Gm.)

Form of *Dendroica*, but bill slender, acute, with very obsolete notch; the commissure gently arched or curved from the base; the gonys also straight or even slightly concave. Tongue lengthened, narrow, deeply bifid (for one-

third), and deeply lacerated or fringed externally at the end; the edge along the median portion folded over on the upper surface, but not adherent.

On page 161 I have given the reasons for considering "*Dendroica tigrina*" as the type of a special genus of *Sylvicolidæ*, and for retaining it in this family rather than placing it in *Cærebidæ*, to which there is so much apparent resemblance in the tongue. In the structure and character of this organ the species differs very widely from other members of the family, as is shown in the cuts on page 163 accompanying those remarks.

The curvature of the bill in *Perissoglossa tigrina* is quite peculiar among the *Sylvicolidæ* with notched bills. Some *Helminthophagas* (without notch) approximate this character; though in none, excepting *H. bachmani*, is it in equal amount—all the others having the gonys very slightly convex, instead of straight or even slightly concave. It will be of much interest to examine the tongue of *H. bachmani*, should the opportunity ever offer, as it is quite likely to exhibit some noteworthy feature.

The peculiarities of the tongue of *P. tigrina*, and its supposed relationships to *Certhiola*, were first brought to notice by Mr. Gosse.

Perissoglossa tigrina.

Motacilla tigrina, Gmelin, S. N. I, 1788, 985.—*Sylvia tig.* Lath.—*Dendroica tig.* Baird, Birds N. Am. 1858, 286.—Sclater, Catal. 1861, 33, no. 198; P. Z. S. 1861, 71 (Jamaica; April).—March, Pr. A. N. Sc. 1863, 293 (Jamaica; breeds).—A. & E. Newton, Ibis, 1859, 144 (St. Croix. Notes on anatomy of tongue).—Gundlach, Cab. Jour. 1861, 326 (Cuba; not rare).

Sylvia maritima, Wilson, Am. Orn. VI, 1812, 99, pl. liv, fig. 3.—Bon.; Nutt.; Aud. Orn. Biog. V, pl. 414.—D'Orb. La Sagra's Cub. 1840, 70, pl. x.—*Sylvicola mar.* Jard., Bon., Aud., B. A. II, pl. 85.—*Certhiola mar.* Gosse, Birds Jam. 1847, 81.—Ib. Illust.—*Rhimanphus mar.* Cab. Jour. III, 1855, 474 (Cuba).

Hab. Eastern province of United States, north to Lake Winnipeg and Moose Factory; all the West Indies to St. Croix. Breeds in Jamaica. Not recorded from Mexico or Central America.

It is an interesting fact in the history of this bird, that it breeds in Jamaica—specimens of the eggs, as well as of the bird itself, killed in June, July, and August, having been transmitted by Mr. March. These appear to have longer wings, a larger white spot on the tail feathers, and more orange-brown on the throat than I remember to have seen in North American birds; but better specimens will be required to substantiate any real difference.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,633	33	♂	Moose Factory.	May 28, '60.	C. Drexler.	C. Drexler.
10,167	..	♀	Racine, Wis.	...	R. Kennicott.	.....
942	..	♂	Carlisle, Pa.	May 12, '43.	S. F. Baird.	S. F. Baird.
678	..	♀	"	May 17, '42.	"	"
34,510	23	..	Nassau, N. P.	May 14, '64.	C. L. Fitzgerald.	.....
29,624	..	..	Cuba.	...	C. Wright.	.....
20,289	259	♂	Spanishtown, Jam.	July 11, '63.	W. T. March.	W. T. March.
30,288	259	♀	"	"	"	"
26,812	22	♂	"	June 16, '62.	"	"
24,348	36	♂	"	Nov. 1860.	"	"
26 811	237	..	"	Aug. 12, '62.	"	"
30,287	259	..	Healthshire, Jam.	June, 1863	"	"
..	..	..	St. Croix.	Mar. 16, '57.	Cab. A. & E. Newton.	.....
36,628	..	..	St. Thomas.	Winter.	Robt. Swift.	.....

DENDROICA, GRAY.

Sylvicola, GRAY, Genera, 2d ed. 1841, 32 (not of HUMPHREY or SWAINSON).
Dendroica, GRAY, Genera, Appendix, 1842, 8. (Type *Sylvia coronata*, LATH.).
"*Ficedula*, CUV. 1799–1800" (not of MŒHRING, 1752).
Rhimamphus, HARTLAUB, Rev. Zool. 1845, 342 (not of RAFINESQUE).

The genus *Dendroica* is represented by a very large number of species, which vary somewhat in external form, but passing so insensibly from one into the other as to render it exceedingly difficult to subdivide them. They may, perhaps, be most conveniently grouped by their colors, as has been done in "Birds of North America," to which I would refer, as also for general remarks. Nearly all the species belong to the United States, going southward in winter; several are peculiar to Cuba, Jamaica, or Porto Rico, one to the West Indies generally, and three to Central and South America.

Dendroica virens.

Motacilla virens, GMELIN, Syst. Nat. I, 1788, 985.—*Sylvia virens*, LATH. —VIEILLOT, Ois. Am. Sept. II, pl. xciii.—WILS. Am. Orn. II, pl. xxvii, fig. 3.—NUTT.; BON.; AUD. Orn. Biog. IV, pl. 399.—GÄTKE, Naumannia, 1858, 423 (Heligoland, Europe, an original description).—*Sylvicola virens*, SW.; AUD. B. A. II, pl. 84.—REINHARDT, Vid. Med. for 1853, 1854, 72, 81 (Greenland).—*Rhimanphus virens*, CAB. Mus. Hein. Jour. III, 1855, 474 (Cuba; winter).—SCLATER, P. Z. S. 1856, 291 (Cordova).—*Dendroica virens*, BAIRD, Birds N. Am. 1858, 267.—SCLATER & SALVIN, Ibis, 1859, 1 (Guatemala).—SCLATER, P. Z. S. 1859, 363 (Oaxaca?); 373 (Xalapa).—IB. Catal. 1861, 29, no. 181.—LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 293 (Panama).—GUNDL. Cab. Jour. 1861, 326 (Cuba).—*Mniotilta virens*, REINHARDT, Ibis, III, 1861, 5 (Julianehaab, Greenlan

Hab. Eastern province of U. S; Greenland; Heligoland, Europe; south to Panama R. R.; Cuba. In Mexico, Xalapa, and Oaxaca? Cuba alone in West Indies.

Specimens received by the Smithsonian Institution from various localities throughout the whole eastern United States, and westward to the Missouri; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,275	14	♂	Mirador, Mex.	...	Dr. Sartorius.	Dr. Sartorius.
30,682	3,142	..	Tactic, Vera Paz,	Jan. 1860.	O. Salvin.	.....
30,683	3,130	..	Coban, " [Guat.	Nov. 1859.	"	.....
		♂	Guatemala.	...	Cab. Lawrence.	.....

Dendroica occidentalis.

Sylvia occidentalis, TOWNSEND, J. A. N. Sc. VII, II, 1837, 190 (Columbia River).—IB. Narrative, 1839, 340.—AUD. Orn. Biog. V, pl. lv.—*Sylvicola occ.* BON.; AUD. B. A. II, pl. xciii.—*Dendroica occ.* BAIRD, Birds N. Am. 1858, 268.—COOPER & SUCKLEY, R. R. Rep. XII, II, 1859, 178 (N. W. coast).

Dendroica chrysopareia, SCLATER, P. Z. S. 1862, 19.—IB. Catal. 1862, 358 (La Parada, Mex.) (not of P. Z. S. 1860, 19).

Dendroica niveiventris, SALVIN, P. Z. S. May 26, 1863, 187, pl. xxiv, fig. 2 (Guatemala).

Hab. Western province U. S., and Mexico to Guatemala. Not seen at Cape St. Lucas.

A specimen collected in September last, at Fort Whipple, by Dr. Coues, of what I consider to be this species in autumnal plumage, lacks entirely the black of the throat, which is replaced by fulvous white. The yellow of the cheeks extends over the whole chin. The upper parts are glossed with olivaceous, and the black streaks of the back are nearly obsolete.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
36,978	690	..	Fort Whipple, Ariz.	Sept. 3, '64.	Dr. Coues.	Dr. Coues.
5,518	703	♂	Petaluma, Cal.	April, 1856.	E. Samuels.	E. Samuels.
..	101	..	Mexico. [Guat.	...	Cab. Lawrence.	.....
30,681	232	..	Volcan de Fuego,	Dec. 1861.	O. Salvin.	Salvin & Godman.

(36,978.) 4.90; 7.70. (30,611.) Type of *D. niveiventris*.

Dendroica chrysopareia.

Dendroica chrysopareia, SCLATER & SALVIN, P. Z. S. 1860, 298.—IB. Ibis, 1860, 273 (Vera Paz, Guatemala).

Hab. Vera Paz, Guatemala.

(229, Salvin collection.) Head and body above black, the feathers with olive-green edges, especially on the back, obscuring the ground color; rump clear black. Entire side of head (extending to nostrils and on lower jaw), and the partially concealed bases of the feathers on the median line of the forehead, yellow, with a narrow black line from lores, through the eye, widening behind, but not crossing through the yellow. Beneath, including inside of wings, white; a large patch of black covering the chin and throat, and occupying the entire space between the yellow patches of the two sides of the head and neck, and extended along the sides in a series of streaks. Feathers of crissum with black centres. Wings above ashy, with two white bands across the coverts, the scapulars streaked with blackish; first quill edged externally with white, the rest with gray. Tail feathers blackish, edged externally with ashy, the lateral with white at the base. Outer tail feather white on the inner web, except a stripe along the shaft near the end; second similar, but the white not reaching so far towards the base; third with a short patch of white in the end. Bill and legs brownish-black.

Length, 4.50; wing, 2.50; tail, 2.40; tarsus, 2.75.

This species agrees with *virens* and *occidentalis*, to which it is closely related in having the under parts white, with a black patch on the chin and throat. The prevailing black of the upper part, especially of the head and rump, will easily distinguish it from both these species. The black stripe through the eye (wanting in *occidentalis*) is better defined than in *virens*, but there is no trace of an obscure dusky crescent below the eye. *D. townsendii* differs in a much broader patch of black through the eye, with a yellow crescent in it beneath the eye; a much more olivaceous-green back, with ashy rump; the black of the head obscured by green, and the jugulum deep yellow.

The bill in *chrysopareia* is much thicker than in any of the allied species.

The following diagnosis may serve to distinguish the allied species of Warblers with black chins and throat (excluding *D. nigrescens*, which is black, white, and gray, with only a small yellow loral spot):—

COMMON CHARACTERS.—Upper parts more or less olivaceous-green, with the feathers streaked centrally with black (sometimes concealed). Sides of head yellow. Chin and throat black; rest of the under parts, including inside of wings, white, with or without yellow on breast. Wings with two white bands. Inner web of lateral tail feather almost entirely white from the base.

Above bright olive-green, with concealed black streaks; tail coverts ashy. Sides conspicuously streaked with black; crissum unspotted. Jugulum sometimes faintly tinged with yellowish. An obscure dusky olive stripe through the eye, and a crescentic patch of the same some distance beneath it . . . . . *virens*.

Above olivaceous ashy (rump pure ash), with more distinct black spots. Top and sides of head clear yellow, the feathers of the crown tipped with black, or clouded with dusky plumbeous. No dark markings or stripes on side of head. No distinct black streaks beneath; black of throat restricted to front of neck . . . . . *occidentalis.*

Prevailing color of upper part black, with olivaceous edgings on the back; rump and upper tail covert pure black. Sides and crissum streaked with black. A simple black stripe through the eye; no patch beneath it . . . *chrysopareia.*

Above olive-green. Upper tail coverts ashy, with central black streaks. Feathers of head above black, with olive-green edges. A broad olivaceous black stripe through eye from lores, involving the ears, in which is a yellowish crescentic patch below the eye. Black feathers of throat and chin edged with yellow. Jugulum and sides of breast also yellow. Sides streaked with black. No distinct black streaks on crissum . . . . . *townsendii.*

For the opportunity of describing *D. chrysopareia* I am indebted to Mr. Salvin, who kindly forwarded to me his type specimen for the purpose. The species has not been noted except from Guatemala (and Mexico?), but may not improbably be yet found in the Rocky Mountains of the United States.[1] Mr. Salvin's specimen (No. $\frac{229}{1014}$) was killed at Tactic, Vera Paz, Nov. 4, 1859.

Dendroica townsendii.

Sylvia townsendii, "NUTTALL," TOWNSEND, J. A. N. Sc. VII, II, 1837, 191. —AUD. Orn. Biog. V, 1839, pl. 393.—*Sylvicola t.* BON.; AUD. B. A. II, 1841, pl. 92.—*Dendroica t.* BAIRD, Birds N. Am. 1858, 269.—SCL. P. Z. S. 1858, 298 (Oaxaca high lands in winter); 1859, 374 (Totontepec; winter).—SCLATER & SALVIN, Ibis, 1859, 11 (Guatemala). —COOPER & SUCKLEY, P. R. R. XII, II, 1859, 179 (Cal.).

Hab. Western province of U. S., and Mexico, into Guatemala. Migratory.

I have never seen a specimen of this species in pure spring plumage, and I am not sure that the throat ever becomes pure black as in *virens* and its allies. Some specimens have the whole chin and throat yellow—the feathers of the latter very indistinctly dusky in the centre.

[1] A specimen of this bird, or one very closely allied, is said to have been recently collected near San Antonio, Texas, by Dr. A. T. Heermann.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,918	..	..	Columbia Riv., Or.	Oct. 28, '35.	S. F. Baird.	J. K. Townsend.
21,923	..	..	Camp Moogie, W. T.	May 2[illegible], '60.	A. Campbell.	Dr. Kennerly.
4,480	..	..	Santa Clara, Cal.	1855.	Dr. J. G. Cooper.	Dr. J. G. Cooper.
10,720	..	..	Ft. Burgwyn, N. M.	...	Dr. W. W. Anderson.	.....
492	..	..	N. E. Mexico.	...	S. F. Baird. [son.	J. G. Bell.
8,017	..	..	Guatemala.	...	J. Gould.	.....

(2,918.) Type of species from Mr. Audubon's collection.

Dendroica nigrescens.

Sylvia nigrescens, TOWNSEND, J. A. N. Sc. VII, II, 1837, 191 (Columbia River).—AUD. Orn. Biog. V, 1839, 57, pl. 395.—*Vermivora nig.* BON.; NUTT.—*Sylvicola nig.* AUD. B. A. II, pl. 94.—*Rhimanphus nig.* CAB. 1850.—*Dendroica nig.* BAIRD, Birds N. Am. 1858, 270.—SCLATER, P. Z. S. 1858, 298; 1859, 374 (Oaxaca; high mountains, in March).—IB. Catal. 1861, 30, no. 183.—HEERMANN, P. R. R. Rep. X, IV, 40.—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 1859, 180.

?*Sylvia halseii*, GIRAUD, Birds Texas, 1838, pl. iii, fig. 1, ♀ (suggested by Sclater).

Hab. Western and Middle provinces of U. States. Migratory southward into Western Mexico (Oaxaca).

An autumnal male from Fort Whipple differs only from No. 1,908 in greater amount of white edging to the wing feathers, wider streaks on the sides, and absence of black on the back.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,686	378	..	Ft. Steilacoom, W. T.	May 6, '56.	Dr. G. Suckley.	Dr. G. Suckley.
1,908	..	♂	Columbia Riv., Or.	June 16, '35	S. F. Baird.	J. K. Townsend.
2,915	..	♂	"	May 14, '35.	"	"
7,690	..	♂	Calaveras Co., Cal.	...	Lt. Williamson.	Dr. Heermann.
11,518	80	♂	Fort Defiance.	...	Lt. J. C. Ives.	Möllhausen.
31,891	802a	♂	San Diego, Cal.	April 2, '62.	Geol. Surv. Cal.	Dr. J. G. Cooper.
36,979	566	♂	Fort Whipple, Ariz.	Aug. 13, '64.	Dr. E. Coues.	.....

(1,908.) Type of species from Mr. Audubon's collection.

Dendroica cærulescens.

Motacilla canadensis, LINN. Syst. Nat. I, 1766, 336 (not p. 334, which is *D. coronata*).—*Sylvia canadensis*, LATH.; WILSON, II, pl. XV, fig. 7.—AUD. Orn. Biog. II, pl. 148, 155.—SALLÉ, P. Z. S. 1857, 231 (St. Domingo).—*Sylvicola canadensis*, SWAINS., JARD.; BON.; AUD. B. A. II, pl. 95.—*Rhimanphus can.* CAB.—*Dendroica canadensis*, BAIRD, Birds N. Am. 1858, 271.—SCLATER, Catal. 1861, 30, no. 184.—IB. P. Z. S. 1861, 70 (Jamaica).—GUNDL. Cab. Jour. 1861, 326 (Cuba; very common).

Motacilla cærulescens, GM. S. Nat. I, 1788, 960.—*Sylvia cær.* LATH.; VIEILL. II, pl. 80.—*Sylvia cær.* D'ORB. Sagra's Cuba, Ois. 1840, 63, pl. ix, fig. 1, 2.

Sylvia pusilla, WILS. V, pl. 43. fig. 3 (JUV.).—*Sylvia leucoptera*, WILS.

Sylvia palustris, STEPH.—*Sylvia macropus*, VIEILLOT.—*Sylvia sphagnosa*, BON.; NUTTALL; AUD.

Sylvicola pannosa, GOSSE, Birds Jam. 1847, 162 (female).—IB. Illust. no. 37.

Hab. Eastern province of United States; Jamaica, Cuba, and St. Domingo in winter; very abundant. Not recorded from Mexico or Central America.

I have been obliged to adopt the name of *cærulescens*, that of *canadensis* being a synonym of *D. coronata*, of earlier date than as used for the present species.

Specimens in the collection from eastern United States, west to Missouri River; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,301	..	..	Halifax, N. S.	...	W. G. Winton.	W. G. Winton.
17,715	..	..	Monte Verde, Cuba.	April 9.	Chas. Wright.	Chas. Wright.
23,516	..	♀	"	Jan. 17.	"	"
23,517	..	♂	Nouv. Sophie, Cuba.	Dec. 21, '60.	"	"
21,633	..	♂	Tuabuque, Cuba	Nov. 13.	"	"
23,311	69	♂	Trelawney, Jam.	Dec. 20, '59.	P. L. Sclater.	W. Osburn.
24,345	41	♂	Spanishtown, Jam.	Dec. 23, '60.	W. T. March.	.....

Dendroica coronata.

Motacilla coronata, LINN. S. N. I, 1766, 333.—*Sylvia coronata*, LATH.; VIEILLOT, II, pl. 78, 79.—WILS. II, pl. 17, fig. 4; pl. 45, fig. 3.—NUTT.; AUD. Orn. Biog. II, pl. 153.—D'ORB. Sagra's Cuba, Ois. 1840, 60.—*Sylvicola coronata*, SWAINS.; BON.; AUD. B. A. II, pl. 76.—MAX. Cab. Jour. VI, 1858, 114.—JONES, Nat. Bermuda, 59 (abundant in April).—*Dendroica coronata*, GRAY, Genera, 1842, 2.—BAIRD, Birds N. Am. 1858, 272.—SCLATER, P. Z. S. 1859, 363.—IB. Catal. 1861, 30, no. 185.—MARCH, P. A. N. Sc. 1863, 292 (Jamaica, in summer; breeding).—GUNDL. Cab. Jour. 1861, 326 (Cuba; common).—COOPER & SUCKLEY, P. R. R. XII, II, 1859, 180 (Puget Sound).—*Rhimanphus cor.* CAB. Jour. 1855, 473 (Cuba).

Motacilla canadensis, LINN. 12th ed. 1766, 334 (*Ficedula canadensis cinerea*, Br. III, 524, pl. 27, fig. 1).

Parus virginianus, LINN. 12th ed. S. Nat. I, 1766, 342.

Motacilla umbria, cincta, pinguis, GM.

Sylvia xanthopygia, VIEILL. Ois. Am. Sept. II, 1807, 47.—*Sylvia xanthoroa*, VIEILL.

LOCALITIES QUOTED: *S. Greenland*, REINHARDT, Ibis, 1861, 5.—*Cordova*, SCL. P. Z S. 1856, 291.—*Xalapa*, IB. 1859, 363.—*Guatemala*, SCL. & SALV. 1859, 11.—*Panama*, LAWR. Ann. N. Y. Lyc. VIII, 63.—

Cuba, winter, CAB. Jour. III, 473.—*Bahamas*, winter, BRYANT, Bost. Pr. VII, 1859.—*Jamaica*, GOSSE, Birds Jam. 155.—*St. Domingo*, SALLÉ, P. Z. S. 1857, 231.

Hab. Eastern province of North America, and extending sparsely northward along U. S. boundary to Pacific Ocean; Ft. Yukon; Greenland; eastern Mexico to Panama R. R.; western West Indies and Bermuda. Breeds in Jamaica.

The discovery, by Mr. March, that this species breeds in Jamaica is an interesting fact in the history of the species: skins and eggs collected the middle of June have been transmitted by him to the Institution.

Specimens in the collection from all parts of the United States east of the Missouri plains; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,379	..	..	Rigolet, Lab.	...	H. Conolly.	H. Connolly.
23,625	..	..	Moose Factory, H.B.	...	J. McKenzie.	J. McKenzie.
20,627	..	..	" [Can.	July 1, '60.	C. Drexler.	C. Drexler.
20,626	..	..	Temiscamingue,	May 8, '60.	"	"
27,329	1,191	..	Fort Yukon.	...	R. Kennicott.	.....
..	252	..	Anderson River.	...	R. R. McFarlane.	.....
27,247	1,389	..	Fort Good Hope.	May 25.	B. R. Ross.	J. S. Onion.
27,248	1,418	♂	La Pierre's House.	"	"	Jas. Flett.
23,133	931	..	Fort Simpson.	...	"	.....
31,430	3	..	Fort Rae.	June 3, 62.	L. Clarke, Jr.	L. Clarke, Jr.
7,671	351	♂	Ft. Steilacoom, W.T.	May 1, '56.	Dr. Suckley.	.....
30,575	90	..	Mirador, Mex.	Nov. 1862.	Dr. Sartorius.	Dr. Sartorius.
32,463	332	..	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.
30,693	3,150	..	Coban, Guat.	Nov. 1859.	O. Salvin.	.....
30,694	237	♀	Duenas, Guat.	Feb. 4, '59.	"	.....
30,292	258	♀	Spanishtown, Jam.	June 11, '63.	W. T. March.	W. T. March.
33,478	..	..	Porto Rico.	Winter.	Robert Swift.	.....
..	115	..	Panama.	1862.	Cab. Lawrence.	J. M'Leannan.

(7,671.) The only specimen seen from U. S. west of Missouri valley.

Dendroica audubonii.

Sylvia audubonii, TOWNSEND, J. A. N. Sc. VII, II, 1837.—IB. Narrative, 1839, 342.—AUD. Orn. Biog. V, 1839, 52, pl. 395.—*Sylvicola audubonii*, BON. List, 1838.—AUD. B. A. II, 1841, 26, pl. 77.—*Dendroica audubonii*, BAIRD, Birds N. Am. 1858, 273.—SCLATER, P. Z. S. 1858, 298 (Oaxaca; October); 1860, 250 (Orizaba).—IB. Catal. 1861, 30, no. 186.—SCLATER & SALVIN, Ibis, 1860, 273 (San Geronimo, Guat.).—HEERMANN, P. R. R. Rep. X, IV, 1860, 39.—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 1859, 181.—SCLATER, P. Z. S. 1864, 172 (City of Mexico).

Hab. Western and middle provinces of the U. S.; Cape St. Lucas; western Mexico and Orizaba?

Specimens in the collection from all parts of the western United States, as far east as the limits of the high central plains; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,287	2,454	♀	Cape St. Lucas.	...	John Xantus.	John Xantus.
32,175	3,405	♂	San Jose, C. St. L.	Nov. 25, '59.	"	"
23,751	..	..	Mazatlan.	...	National Institute.	.. ...
35,037	2,220	♂	Tonila, Jalisco, Mex.	Oct. 1863.	John Xantus.	.....

Dendroica blackburniæ.

Motacilla blackburniæ, GMELIN, S. N. I, 1788, 977.—*Sylvia bl.* LATH.; VIEILLOT, II, pl. 96.—WILSON, III, pl. 23.—NUTT.; AUD. Orn. Biog. II, V, pl. 135, 399.—*Sylvicola bl.* JARD.; RICH.; AUD. B. A. II, pl. 87.—*Rhimanphus bl.* CAB. Mus. Hein. 1850, 19.—*Dendroica bl.* BAIRD, Birds N. Am. 1858, 274.—SCLATER & SALVIN, Ibis, 1859, 11 (Guatemala).—SCLATER, P. Z. S. 1859, 363 (Xalapa); Ib. 1860, 64 (Ecuador).—IB. Catal. 1861, 30, no. 187 (Pallatanga and Nanegal, Ecuador).

?*Motacilla chrysocephala*, GMELIN, I, 1788, 971 (Figuier orangé et F. étranger, BUFF. V, 313, pl. 58, fig. 3, Guiana).

Sylvia parus, WILS. V, pl. 44, fig. 3.—AUD. Orn. Biog. II, pl. 134.—*Sylvicola parus*, AUD. B. A. II, pl. 83.

Sylvia lateralis, STEPH.

?*Motacilla incana*, GMEL. I, 1788, 976.—*Sylvia incana*, LATH.; VIEILL.

?*Sylvia melanorhoa*, VIEILL. Nouv. Dict. XI, 1817, 180 (Martinique).—IB. Encycl. Méth. II, 444.

LOCALITIES QUOTED: *Bogota*, SCLATER, P. Z. S. 1855, 143.—*Panama*, LAWR. Ann. N. Y. Lyc. VII, 62.—*Costa Rica*, CAB. Jour. 1860, 328.—*Bahamas*, BRYANT, Bost. Pr. VII, 1859.

Hab. Eastern province of U. S.; eastern Mexico, and south to Bogota and Ecuador; Bahamas alone of West Indies with certainty.

Specimens from the United States generally east of the Missouri plains; none from north of its limits; also from—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,712	32,625	♀	Coban, Guat.	...	Verreaux.	.....
32,709	32,624	♂	"	...	"	.....
30,684	3,717	..	"	1861.	O. Salvin.	.....
30,685	247	♀	"	Nov. 1859.	"	.....
30,490	108	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
30,488	104	..	.....	...	.....	.....
33,275	105	..	.....	...	.....	.....
33,274	107	..	.....	...	.....	.....
30,489	106	..	.....	...	.....	.....
33,271	..	..	San Jose, C. R.	...	J. Carmiol.	.....

Dendroica castanea.

Sylvia castanea, WILS. Am. Orn. II, 1810, 97, pl. xiv, fig. 4.—BON.; NUTT.; AUD. Orn. Biog. I, pl. 69.—*Sylvicola castanea*, SWAINS.; JARD.; RICH.; BON., AUD. B. A. II, pl. 80.—*Rhimanphus castaneus*, CAB.—*Dendroica*

castanea, BAIRD, Birds N. Am. 1858, 276.—SCLATER & SALVIN, Ibis, 1859, 11 (Guatemala).—SCLATER, Catal. 1861, 31, no. 188.—CASSIN, Pr. A. N. Sc. 1860, 193 (Isthmus Darien; winter).—LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Ist. Panama; winter).

Sylvia autumnalis, WILS. III, pl. 23, fig. 2.—AUD. Orn. Biog. I, pl. 88.

Hab. Eastern province of North America to Hudson's Bay; Guatemala, south to Isthmus of Darien. Not recorded from Mexico or West Indies; crosses probably in migrating direct from Florida to Yucatan.

Specimens from United States generally east of Missouri plains; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,629	..	♂	Moose Factory.	June 2, '60.	C. Drexler.	C. Drexler.
32,341	..	..	"	...	J. McKenzie.	.....
..	112	..	Panama.	...	Cab. Lawrence.	M'Lean. & Galb.
21,702	320	..	Turbo, N. G.	...	Lt. Michler.	A. Schott.
21,701	..	♀	Truando, N. G.	...	"	"

Dendroica pinus.

Sylvia pinus, WILS. Am. Orn. III, 1811, 25, pl. xix, fig. 4.—BON.; NUTT.; AUD. Orn. Biog. II, pl. 111.—*Thryothorus pinus*, STEPH.—*Sylvicola pinus*, JARD.; RICH.; BON.; AUD. B. A. II, pl. 82.—JONES, Nat. Bermuda, 1859, 59 (abundant in Oct.).—*Rhimanphus pinus*, BON.—*Dendroica pinus*, BAIRD, Birds N. Am. 1858, 277.—SCLATER, Catal. 1861, 31, no. 189.—COUES, Pr. A. N. Sc. 1861, 220 (Labrador coast).

Sylvia vigorsii, AUD. Orn. Biog. I, 1832, 153, pl. 30.—*Vireo vigorsii*, NUTT.

Hab. Eastern province of U. S., north to Labrador; winters in U. S. Not recorded in West Indies or middle America (except Bermuda?).

Specimens in the collection from United States generally east of the Missouri plains and from Labrador; none from south of the United States.

Dendroica montana.

Sylvia montana, WILS. Am. Orn. V, 1812, 113, pl. xliv, fig. 2 ("Blue Mts. of Pennsylvania").—AUD. Orn. Biog. V, 294 ("California"!)—*Sylvicola montana*, JARD.; AUD. B. A. II, 1841, 69, pl. 98.—*Dendroica montana*, BAIRD, Birds N. Am. 1858, 279.

Sylvia tigrina, VIEILL. Ois. Am. Sept. II, 1807, 34, pl. 94 (U. S. and St. Domingo).—BON.

The only cases on record of the occurrence of this species are those described by Wilson, Vieillot, and Audubon. I am not aware that any specimens are now extant in any collection, at least I have never seen or heard of any.

Dendroica pennsylvanica.

Motacilla pennsylvanica, LINN. S. N. I, 1766, 333, no. 19; GMELIN.—*Sylvia p.* LATH.; WILSON, I, pl. xiv. fig. 5.—*Dendroica p.* BAIRD, Birds N. Am. 1858, 279.—SCLATER & SALVIN, Ibis, 1859, 11; 1860, 273 (Coban, Guat.; November).—SCLATER, Catal. 1861, 31, no. 191.

Sylvia icterocephala, LATH. Ind. Orn. II, 1790, 538.—VIEILL. II, pl. 90; BON.; AUD. Orn. Biog. I, pl. 59.—*Sylvicola ict.* SWAINS.; JARD.; AUD. B. A. II, pl. 81.—*Dendroica ict.* SCLATER, P. Z. S. 1859, 363 (Xalapa); 373 (Oaxaca).

OTHER LOCALITIES: *Bahamas*, BRYANT, Pr. Bost. Soc. VII, 1859.—*Costa Rica*, CAB. Jour. 1860, 328.—*Panama*, winter, LAWR. Ann. N. Y. Lyc. 1861, 322.

Hab. Eastern province of the U. S.; Bahamas; Guatemala to Costa Rica and Panama R. R. Not recorded from Mexico or West Indies, except Bahamas.

Specimens in the collection from all parts of the United States east of the Missouri plains; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,689	3,127	..	Tileman, Vera Paz, Guatemala. [Guat.	Jan. 1861. ...	O. Salvin. Cab. Lawrence.	....

Dendroica cærulea.

Sylvia cærulea, WILS. Am. Orn. II, 1810, 141, pl. xvii, fig. 5.—*Sylvicola c.* SWAINS.; JARD.; RICH.; BON.; AUD. Orn. Biog. I, pl. 49; NUTT.—*Dendroica c.* BAIRD, Birds, N. Am. 1858, 280.—SCLATER, Catal. 1861, 31, no. 192.—GUNDL. Cab. Jour. 1861, 326 (Cuba; very rare).

Sylvia rara, WILSON, II, pl. xxvii, fig. 2.—BON.; AUD. Orn. Biog. I, pl. 49.

Sylvia azurea, STEPH. Shaw, Zool. X, 1817.—BON. Am. Orn. II, 1828, pl. 27 (♀).—AUD. Orn. Biog. I, pl. 48, 49; NUTT.

Sylvia bifasciata, SAY, Long's Exped. I, 1823, 170.

Sylvia populorum, VIEILL. Encyc. Méth. II, 1823, 449 (from Wilson).

OTHER LOCALITIES: *Bogota*, SCLATER, P. Z. S. 1857, 18.—*Panama R. R.*, LAWRENCE, Ann. N. Y. Lyc. 1861, 222.

Hab. Eastern United States, north to Niagara Falls; Cuba (very rare); Guatemala, Panama, and Bogota. Not recorded from Mexico or West Indies (except Cuba).

Specimens in the collection from the United States east of the Missouri plains, as far north as Carlisle in the east, and Michigan in the west; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
12,160	..	♂	Cherokee Nation.	July 4, 1849.	Dr. Woodhouse.	Dr. Woodhouse.
32,713	32,713	♀	Coban, Guat.	...	Verreaux.	.....
..	104	..	Guatemala.	...	Cab. Lawrence.	.....
34,614	..	..	Bogota.	...	J. H. Roome.	.....

Dendroica pharetra.

Sylvicola pharetra, GOSSE, Birds Jam. 1847, 163.—Ib. Illust. Birds Jam. —OSBURN, Zoologist, 6660.—*Dendroica pharetra*, SCLATER, P. Z. S. 1851, 71.—Ib. Catal. 1862, 355, no. 193.

Hab. Jamaica only.

As stated by Dr. Sclater, this is a perfectly good species, rather similar in general appearance to *Mniotilla varia*, but with the feet and bill of *Dendroica*. The resemblance to *D. striata* is quite close. The specimens before me are not in very good condition, but the colors differ from those of *Mniotilla varia* in having all the feathers of the crown black, edged with white, causing a fine streaking, instead of having the crown black with white median and lateral stripe (*M. varia*), or entirely black (*D. striata*). The rump and upper tail coverts are unstreaked brownish-olive, not black as in *M. varia*, nor streaked with black, as in *D. striata*. The sides of the head are streaked or spotted with black; the streaks are on the front of the jugulum as well as the sides. There is no large white patch on the inner web of the outer tail feathers as in the two other species mentioned, but merely a dirty whitish edging at the ends of the same feathers. This last mentioned character will probably distinguish it in any stage of plumage. Bill very stout. Length, 4.70; wing, 2.55; tail, 2.50.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,310	50	..	St. Armand, Jam.	...	P. L. Sclater.	W. Osburn.
23,309	50	..	"	Sept. 1859.	"	"
27,942	..	..	Trelawney, Jam.	Aug. 24, '59.	"	"

Dendroica striata.

Muscicapa striata, FORSTER, Phil. Trans. LXII, 383, 428.—*Motacilla s.* GMELIN.—*Sylvia s.* LATH.; VIEILLOT, II, pl. 75, 76.—WILS. IV, pl. 30, fig. 3; VI, pl. 54.—BON.; NUTT.; AUD. Orn. Biog. II, pl. 133.—LEMBEYE, Av. Cuba, 1850, 33.—*Sylvicola s.* SWAINSON; BON.; AUD. B. A. II, pl. 78.—REINHARDT, Vid. Med. for 1853, 1854, 73 (Greenland).—MAX. Cab. Jour. VI, 1858, 113.—*Mniotilta s.* REINH. Ibis, 1861, 6 (Greenland).—*Rhimanphus s.* CAB. Jour. III, 475 (Cuba).—*Dendroica s.* BAIRD, Birds N. Am. 1858, 280.—COUES, Pr. A. N. Sc. 1861, 220 (Labrador coast).—SCLATER, Catal. 1861, 31, no. 193.—GUNDL. Cab. Jour. 1861, 326 (Cuba; rare).

OTHER LOCALITIES QUOTED: *Bogota*, SCLATER, P. Z. S. 1855, 143.—*Bahamas*, BRYANT, Pr. Bost. Soc. VII, 1839.

Hab. Eastern province of all N. America to Arctic Ocean; Greenland; Cuba, in winter (rare); Bahamas; Bogota. Not recorded from intermediate localities.

Landbeck, in Wiegmann's Archiv für Naturgesch. for 1864, page 56, describes as new a *Dendroica atricapilla*, collected at Valdivia, Chile, in June 17, 1858. Without expressing a definite opinion on the subject, I cannot distinguish this bird, by his description, from *D. striata*, although the dimensions appear rather smaller.

D. striata, *D. coronata*, and *D. æstiva* are the only species of the genus that occur as far north as the shores of the Arctic Ocean.

Very many specimens in the collection from the whole United States east of the Missouri plains, as well as from the interior of British North America; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,084	80	♂	Grosvater Bay, Lab.	July 17, '59.	Elliot Coues.	Elliot Coues.
20,552	..	..	Labrador.	...	Williams' Coll.	.....
20,639	471	..	Fort George, H. B.	July 7, '60.	C. Drexler. [Lyc.	.....
27,330	1,215	♀	Ft. Youkon.	June 10, '61.	R. Kennicott.	R. Kennicott.
31,124	71	..	Peel's River.	...	C. P. Gaudet.	.....
31,423	353	..	Fort Anderson.	June 21.	R. R. McFarlane.	.....
22,640	586	..	Fort Good Hope.	Sept. 1861.	B. R. Ross.	J. S. Onion.
22,641	567	..	Fort Simpson.	"	"	.....
22 631	672	..	Big Island, S. Lake.	...	"	J. Reid.
22,800	427	..	Fort Rae, "	June 13, '61.	L. Clark, Jr.	L Clark, Jr.
19,504	621	♂	Ft. Resolution,"	June 7, '60.	R. Kennicott.	R. Kennicott.
34,522		..	Nassau, Bahamas.	May 12, '64.	C. L. Fitzgerald.	.....
	105	♀	Bogota.	...	Cab. Lawrence.	.....

(27,330.) With eggs.

Among the American *Sylvicolidæ* is a group of what may be called "Golden Warblers," having, as their common characters, the body yellowish-green above, golden yellow beneath; the quills and tail feathers dark brown, margined internally with yellow, externally with the color of the back; the breast and sides streaked with orange brown, of which color is also sometimes the head. This combination of characters is peculiar to the group, and especially the yellow of the inner webs of the tail feathers, which is found in no other American Warblers. Originally represented by a single species—the familiar *D. æstiva* of the United States—the list has recently been largely increased. All except *æstiva* belong to Middle America, or the northern part of South America, but especially to the West Indies, where, it is probable, that each large island will be found to have its own peculiar representative, as is the case to a greater or less extent with *Certhiola*, *Loxigilla*, *Saurothera*, *Todus*, and many other genera. The diagnostic characters of the male birds of the best known species are as follow:—

Forehead and vertex, with sides of head and throat, yellow. Lateral tail feather entirely yellow, except a dusky streak along the shaft towards the end. Inner webs of all tail feathers yellow to the shaft, except the sixth or central. Wings pointed.

First quill nearly the longest, and always exceeding the 4th . . . *æstiva.*

Forehead yellowish; vertex only brownish-orange, this sometimes concealed by greenish tips. Sides of head and throat yellow. Outer web of lateral tail feather (except on the margin) dusky. Yellow of inner edge of quills not reaching the shaft, except perhaps in *petechia.* Wings rounded.

Second quill longest; 1st longer than the 5th. Larger wing covert edged with olivaceous, scarcely more yellow externally; alula brown, not margined. Yellow patch on inner web of outer tail feather, not reaching the shaft; the 5th only narrowly edged with yellow . . . *gundlachii.*

Third quill longest; 1st shorter than the 5th. The olivaceous edges of larger wing coverts brightening externally into golden yellow; alula sharply margined with yellow. Yellow patch on inner web of lateral tail feather reaching the shaft; inner web of 5th feather with marginal half yellow . . . . . *petechia.*

Similar to last, but wings shorter. The 3d quill longest; the 1st quill longer than the 4th and 5th. Yellow of inner webs of tail feathers not reaching the shaft . . *ruficapilla.*

Entire head, including sides and inferior surface, orange-brown. Yellow of inner edge of quills reaching the shaft. Tail feathers much as in the last. Wings rather rounded.

Third quill longest; 1st longer than the 5th; edges of wing coverts brightening into golden yellow. Orange brown confined to the head and neck. Wing 2.75 long . . *vieilloti.*

Similar to last, but considerably smaller. Orange brown of head extending inferiorly to the jugulum. Wings, 2.25 . . . . . *rufigula.*

In addition to the species just mentioned the *Sylvicola aureola* of Gould, and the *S. eoa* of Gosse evidently belong to the Golden Warblers, although their precise relationships cannot be defined for want of specimens.[1]

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[1] **Dendroica aureola.**

Sylvicola aureola, GOULD, Voyage Beagle, Birds, 1841, 86, tab. 28.

"Nape, back, and tail coverts yellowish-olive; wings and tail blackish, broadly margined with yellow; front and crown yellow, with the tips of the feathers reddish castaneous; hind head gray, mixed with yellow, the cheeks and throat bright yellow; breast of same color, each feather marked down

Dendroica æstiva.

Motacilla æstiva, Gm. S. N. I, 1788, 996.—*Sylvia æstiva*, Lath.; Vieill. II, pl. 95.—Bon.; Aud. Orn. Biog. I, pl. 35, 93; Nutt.—*Sylvicola æst.* Swains.; Bon.; Aud. B. A. II, pl. 88.—Max. Cab. Jour. 1858, 114.—*Rhimamphus æst.* Bon.; Cab. Jour. III, 472 (Cuba).—Sclater, P. Z. S. 1857, 202.—*Dendroica æst.* Baird, Birds N. Am. 1858, 282.—Sclater, P. Z. S. 1859, 363.—Ib. Catal. 1861, 32, no. 194 (Ecuador, Cayenne, N. Grenada).—Taylor, Ibis, 1864, 81 (Trinidad).—Cooper & Suckley, P. R. R. XII, II, 1859, 181 (N. W. coast).

Sylvia carolinensis, Lath. Ind. Orn. II, 1790, 551.

?Sylvia flava, Vieillot, II, 1807, 31, pl. 81.

Sylvia citrinella, Wils. II, pl. xv, fig. 5.

Sylvia childreni, Aud. Orn. Biog. I, 1831, pl. 35 (young).

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the middle with pale reddish castaneous; sides and middle of the abdomen whitish. *Hab.* Galapagos.

"Length, 5 inches; wing, $2\frac{1}{2}$; tail, $2\frac{3}{16}$; tarsus, $\frac{10}{16}$; bill, $\frac{8}{16}$."

This species appears to resemble *petechia* in coloration, but to differ in fewer and less distinct stripes beneath, in the gray of the head, and lightness of the abdomen. There is no mention made of the proportions of the quills.

Dendroica eoa.

Sylvicola eoa, Gosse, Birds Jamaica, 1847, 158.—Ib. Illustration Birds Jamaica.

Hab. Jamaica (Crab Pond, Jan. 24).

"Male. Upper parts olive, approaching to yellow on the rump; sides of head marked with a band of orange, extending from the ear to the beak, and meeting both on the forehead and on the chin. Wing quills and coverts blackish, with yellowish edges. Tail blackish-olive, with yellow edges; the outermost two feathers on each side have the greatest portion of the inner webs pale yellow. Under parts pale yellow. The crown, rump, tertials, belly, and under tail coverts sparsely marked with undefined spots of pale orange."

"Female. Nearly as in the male, but the deep orange is spread over the whole cheeks, chin, throat, and breast. The head and back are dusky gray, tinged with olive, and patched with the fulvous much more largely, but irregularly, as if *laid upon* the darker hue.

"Length, 5 inches; expanse, 7.60; wing, 2.70; tail, 1.90; rictus nearly .60; tarsus, .90; middle toe, .50. Irids dark hazel; feet horn-color; beak pale horn; culmen and tip darker."

The preceding description, copied from Gosse, relates to a Jamaica Warbler, unknown, excepting from the preceding account, but evidently having a close relationship to the Golden Warblers. It appears to have the head all round orange (brown?), as also perhaps the rump and tertials; and to be marked (streaked?) with the same beneath, including the crissum. The inner webs of the tail feathers are yellow, as in the Golden Warblers.

?Sylvia rathbonia, AUD. Orn. Biog. I, 1831, pl. 65.—*Sylvicola r.* AUD. B. A. II, pl. 89.

?Motacilla rubiginosa, PALLAS, Zoog. Rosso-Asiat. I, 1831, 496 (Kodiak).

Rhimamphus chryseolus, BON. Bull. Soc. Linn. Caen, II, 1851, 32 (*D. æstiva*, from South America; Cayenne).

OTHER LOCALITIES: *Xalapa*, SCLATER, P. Z. S. 1859, 363.—*Guatemala*, SCLATER & SALVIN, Ibis, 1859, 11.—*Panama*, winter, LAWR. Ann. N. Y. Lyc. 1861, 322.—*Turbo*, *N. Grenada*, CASS. Pr. A. N. Sc. 1860, 191.—*Bogota*, SCLATER, Pr. 1855, 143.—*City of Mexico*, IB. 1864, 172.

Hab. Entire North America, into South America as far as Ecuador, Cayenne, and Trinidad. Not recorded from West Indies, where replaced by allied species.

No North American bird has a wider range throughout the entire continent, or is more abundant and familiar, breeding apparently as far south as Mazatlan if not through Central America. Its range into South America is also quite extensive, reaching Ecuador through New Grenada, and eastward as far as Cayenne and Trinidad. I have sought in vain for tangible characters to distinguish more than one species, apparent discrepancies in single southern specimens having been matched by others from the United States.

A skin from Costa Rica (30,487) appears to have more yellow than usual on the inside of the quills, and a considerable amount of red on the head; not more, however, than in upper Missouri specimens. Others exhibit occasional differences from the typical character, but nothing of apparent specific value. A specimen from Guatemala, probably female, is much smaller than any other in the collection, measuring only 4.00; wing, 2.25; tail, 1.85.

If there is any feature apparently belonging more to southern than northern skins it is a greater paleness of bill, and a tendency to a narrow line of dusky along the outer side of shaft of outer tail feather, reaching to its base, instead of only about half way. Even this, however, is not constant, and may be more a condition of winter plumage than anything else.

I have not noticed in young birds the peculiar whiteness of the throat and ash of the sides of head and nape, seen in *D. petechia*.

Specimens (about 200 in all) are in the collection from nearly all regions of North America, from the Atlantic to the Pacific, and north to the Arctic Ocean; from Forts Yukon, Good Hope, Anderson, Simpson, Rae (where very abundant), Resolution; Moose Factory, etc. (None from Cape St. Lucas?) · also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
35,016	285	Juv.	Mazatlan.	...	A. J. Grayson.	.....
32,712	20,167	♀	Mexico.	...	Verreaux.	.....
29,356	121	♂	Colima, Mex.	Feb. 1863.	J. Xantus.	J. Xantus.
30,687	259	..	Dueñas, Guat.	...	O. Salvin.	.....
31,688	3,160	..	"	Sept. 1859.	"	.....
30,686	263	..	Petaleuleu, Guat.	Sept. 1862.	"	Salvin & Godm.
30,553	..	♀	La Libertad, S. S.	Sept. 13, '63.	Capt. J. M. Dow.	Capt. J. M. Dow.
30,487	130	..	San Jose, C. R.	...	Dr. Frantzius.	.....
34,656	..	..	"	...	J. Carmiol.	.....
17,897	340	♀	Turbo, N. G.	...	Lt. Michler.	A. Schott.
17,898	329	♂	"	...	"	"
..	..	..	Panama.	...	Fred. Hicks.	.....
30,601	..	..	Trinidad.	...	M. Galody.	.....
..	..	..	"	...	Cab. A. & E. Newton.	.....

Dendroica gundlachi.

?Motacilla albicollis, GMELIN, Syst. Nat. I, 1788, 983 (*Ficedula dominicensis*, BRISSON III, 494, tab. 26, fig. 5, St. Domingo).—*Dendroica albicollis*, CASSIN, Pr. A. N. Sc. 1860, 192.—LAWRENCE, Ann. N. Y. Lyc. 1860, 18 (Cuba).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba).

??Motacilla chloroleuca, GMELIN, Syst. Nat. I, 1788, 984 (*Ficedula dominicensis minor*, BRISSON, III, 496, tab. xxvi, fig. 2, St. Domingo).

Sylvia æstiva, LEMBEYE, Aves Cuba, 1850, 31, not the figure.—*Rhimanphus æstivus*, CABANIS, Jour. 1855, 472 (Cuba).

Dendroica gundlachi, BAIRD.

Hab. Cuba.

Wings rounded, rather short; the 2d quill longest; 3d and 4th successively very little shorter; 1st intermediate between 4th and 5th: difference between 1st and 2d quill .07. (The five specimens before me all agree in these characters.)

(♂.) Upper parts dark yellowish-green, scarcely brighter on the rump, the shaft of the feathers perhaps more dusky. Top of the head more and more yellowish to the bill, especially towards the bases of the feathers; the central portions of the feathers tinged with reddish (Mr. Lawrence speaks of a male bird having the whole crown of a deep orange color). Under parts bright yellow; the jugulum and sides streaked with reddish. Wing feathers dark brown; the quills and coverts edged externally with the dull olive of the back, which scarcely becomes more yellow on the margin of the coverts, as in *petechia*; the marginal color of the primaries towards their ends passing into gray; the alula uniform brown; the quills margined internally, but not sharply, with yellowish, which is almost a dull white towards the ends viewed from above. The upper surfaces of the tail feathers are dark greenish-brown, margined externally like the rump; the outer four feathers have rather illy defined yellow patches on their inner webs towards the end, which, however, on the outer feather does not quite reach the shaft, and is separated on the others by a greater and greater interval of the ground color; the 5th has the inner margin alone yellow. The bill is plumbeous, with pale edges; the feet apparently greenish.

A female bird is quite similar, but with the yellow patches on the tail still

more restricted. A young bird with much worn plumage belonging to Dr. Gundlach's collection, the same as that referred to by Mr. Lawrence, is ashy above, with patches of olive-green; the under parts creamy white, strongly tinged with yellow across the breast and on crissum. The yellow patches of tail feathers much restricted. A young male (34,504), farther advanced, has the adult plumage, with only a few patches of light ashy on the nape and sides of neck, and some whitish spots on the chin

Length of 34,504, ♂, 4.90; wing, 2.50; tail, 2.20; tarsus, .88; bill from nostril, .32.

For the opportunity of examining specimens of this species I am indebted to Dr. J. Gundlach, who has transmitted five specimens of different ages and sexes. None of these, however, appear to be in highest spring plumage, for which reason the comparison with the allied species cannot be made entirely satisfactory, and the differences in coloration may not be really quite as great as they now appear. The difference in the structure of the wing would, however, alone be sufficient to separate this species from *petechia*. The tips of the outer four quills are closer together; the 1st quill not .10 less than the 2d; the 2d longest; the 3d and 4th successively very little shorter; the 1st longer, however, than the 5th. In *petechia* the 1st quill is .20 shorter than the 3d (which is longest); the 4th is nearly as long, and decidedly exceeding the 2d; the 1st shorter than the 5th, or about equal to the 6th.

None of the Cuban specimens before me show the red vertex of the full plumaged *petechia* of Jamaica; the feathers being tinged centrally like immature males of the latter species; but, from Mr. Lawrence's statement, the reddish crown belongs equally to both species. The differences in wings and tail, however, exist throughout the entire series of the species. The colors above are much brighter and more yellowish in *petechia;* the wing coverts are broadly edged with yellowish-green, like the back, which color on the edges, and still more on the ends of the greater and middle coverts, passes into almost decided yellow; the edge of the alula and of the wing are bright golden yellow; all the quills are edged conspicuously and uniformly on the outside like the back, and inside abruptly with yellow. In *albicollis* the edging of the wing feathers is much duller and more uniform, without the bright yellow of the coverts and alula. The outer edges of the primaries are more inclined to gray; the yellow of the inner edges of the quills paler, and less abrupt. The yellow of the inner webs of the tail feathers in *albicollis* is more contracted; does not come up so sharply to the shaft, but is usually separated from it, and the 5th feather has only the inner margin yellow, instead of being of this color nearly to the shaft. As already

remarked, however, these differences in coloration may be less apparent with more perfect specimens.

The upper parts are much darker and more olivaceous than in *æstiva;* the top and side of the head lack the bright yellow. The tibiæ are grayish-olive, not bright yellow; the yellow of the wing coverts is wanting, and the yellow edging of the quills internally much less. In *æstiva* the yellow of the tail is more extended—the outer feather being entirely of this color, excepting a streak in the end of the outer web; and even in the fifth tail feather the entire inner web is yellow, except at the extreme tip. The wing is much more pointed in *æstiva;* the 1st quill being generally longest, and considerably exceeding the 4th, instead of being less.

The determination of the specific name of this species has been a matter of considerable perplexity. I am by no means satisfied that the St. Domingan and the Cuban birds are the same; and even if identical, the name *albicollis* is a misnomer, liable to cause a very erroneous impression, as the throat is golden-yellow, except in the very young bird, when alone it is dirty whitish. I have, therefore, thought best to impose a new name, borrowing it from the eminent naturalist who has given to us a knowledge of the Ornithology of Cuba scarcely less perfect than that of the eastern United States.

The name of *chloroleuca*, Gmelin, which may refer to the same species, unless there be two with rufous crown in St. Domingo, is equally objectionable with *albicollis*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,502	..	♀	Cuba.	April, 1864.	Dr. J. Gundlach.	.....
34,503	..	♂	"	"	"	.....
34,504	..	♂	"	"	"	.....
34,505	..	♀	"	"	"	.....

Dendroica petechia.

Motacilla petechia, Linn. S. N. I, 1766, 334 (based on *Avicula lutea vertice rubro*, Edwards, V, 99, tab. 256, fig. 2, erroneously quoted as from Penna.).—*Dendroica petechia*, Sclater, P. Z. S. 1861, 71.—Ib. Catal. 1861, 32, no. 195.—March, Pr. An. Sc. 1863, 292 (Jamaica; nesting).

Sylvicola æstiva, Gosse, Birds Jam. 1847, 157.

Hab. Jamaica.

(No. 22,153, ♂.) Above yellowish-green, rather brighter on the rump; the top of the head from bill, brownish-orange, with the bases of the feathers yellow (in some specimens their tips not unfrequently like the back, thus conceal-

ing the orange). Under parts, including tibra, lores, and cheeks below the eye, bright golden-yellow, the jugulum, breast, and sides streaked with brownish-orange; crissum plain. Wing feathers dark brown, broadly margined externally with the color of the back, of nearly the same tint on the edges of the primaries, but considerably more yellowish towards the edges of the greater and middle coverts and secondaries. All the quills edged internally (and the alula externally) and sharply with sulphur-yellow, like the lining of the wings, but not reaching the shaft of the feather—being cut off even at the base of the feather by a very narrow portion of the ground color. Tail feathers dark greenish-brown, becoming darker centrally, the outer edges like the back; the shafts black above, white beneath, the inner webs (except in the two central) bright yellow, except at the tips—the yellow not quite reaching the shaft on the fourth feather, and extending only half way to it on the fifth. In specimens of less perfect plumage the shafts of all the feathers are margined internally with the color of the outer webs, this widening on the more anterior feather.

The female (and perhaps autumnal male) differs in a more restricted amount or entire deficiency of the brownish-orange of the crown, and the more obsolete stripes beneath, as well as to some extent in the markings of the tail as above described. Young birds have the throat and chin creamy white, the nuchal region and the sides of head and neck strongly tinged with light ash. The other characters appear much as described.

The wings in this bird are rather short, and much rounded; the 3d quill is longest; the 4th a little shorter than the 2d; the 1st is intermediate between the 5th and 6th, very rarely equal to, still less frequently a little longer than the 5th, perhaps never exceeding the 4th. In eight specimens the succession of length of the quills is expressed by the formula 3. 4. 2. 5. 1. 6; in two, 3. 4. 2. 1. 5. 6. The tail is considerably rounded.

Total length, 4.90; wing, 2.62; tail, 2.30, its graduation .15; difference between 1st and 3d primaries, .22; bill from forehead, .50, from nostril, .32, along gape, .60; tarsus, .80.

This species, though very similar in external appearance to *D. æstiva*, may be readily distinguished on comparison. It is a rather larger bird, with much (disproportionately) broader quills and tail feathers. Thus the greatest width of the outer primary is .31, instead of .25 to .27. A difference in the proportion of the quills is constant. As stated, the 3d quill is generally longest in *petechia;* the 1st generally shorter than the 5th, always shorter than the 4th. In *æstiva* the wing is much more pointed; the 1st quill is about equal to the 2d and 3d, rarely a little shorter; more frequently longer, and .25 or more longer than the 5th, instead of being less; and very nearly equal to the 3d, not .20 shorter.

The differences in coloration consist in the more greenish tinge of the upper parts in *petechia;* the edges of the quills greenish-yellow, especially the outer primaries, not almost pure yellow. The yellow of the inner webs of the tail feather, in very perfect specimens, only

reaches the shaft on the outer three feathers alone, and in fact even here the upper surface shows a slight suffusion of the color of the shaft along its inner edge. The isolation on the fourth feather, however, amounts to two or three hundredths of an inch, and on the fifth to half the web. In most specimens, however, there is more or less brown along the inside of all the shafts. In high plumaged males of *æstiva* the yellow reaches the shaft in the outer five feathers, the fifth exhibiting a slight suffusion only in its terminal half; sometimes, however, this suffusion is seen on the fourth. There is considerably less yellow on the inner edges of the quills than in *æstiva* in which the yellow reaches the shaft near the base.

The orange-brown tinge to the whole top of the head is an important character of *petechia*, even though sometimes wanting or obscured. Not unfrequently, however, traces of the same are seen in *æstiva;* and one specimen (4,300, Louisiana) has as much reddish in the crown as many males of *petechia.*

I have not noticed, in *petechia*, the obscure brownish streaks seen on the backs of high plumaged specimens of *æstiva;* and the rump is more uniformly greenish-olive, instead of having the feathers much edged with yellow.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,314	62	♂	Savannah le Mar.	Aug. 2, '58.	P. L. Sclater.	W. Osburn.
23,315	62	♀	Portland, Jam. [Jam.	April, 1859.	"	"
24,314	196	♂	Spanishtown, Jam.	Aug. 28, '61.	W. T. March.	.....
26,808	38	♂	"	Aug. 1862.	"	.....
26,809	238	♀	"	"	"	.....
24,353	202	♂	"	Aug. 28, 61.	"	.....
24,352	...	Juv [♀	"	"	"	.....

Dendroica

?*Motacilla ruficapilla*, GMELIN, S. N. I, 1788, 971 (based on *Ficedula martinicana*, BRISSON, III, 490, pl. xxii, fig. 4, Martinique).

?*Chloris erithachorides*, FEUILLÉ, Jour. Obs. Phys. III, 413.

?*Dendroica æstiva*, NEWTON, Ibis, I, 1859, 143 (St. Croix).

?*Dendroica petechia*, CASSIN, Pr. A. N. Sc. 1860, 192, 376 (St. Thomas). —?*Sylvia petechia*, VIEILL. Ois. Am. Sept. II, 1807, 32, pl. 91 ("U. States").

I have little doubt that the Golden Warblers of St. Croix and St. Thomas are specifically different from those inhabiting Jamaica and Cuba respectively, and would not be much surprised to find that each of the first-mentioned islands, as well as others of the West Indian group, possessed a Golden Warbler peculiar to itself.

I have before me a St. Croix skin kindly lent by Mr. Newton, and one from St. Thomas, from Mr. Lawrence's collection, and have examined other St. Thomas specimens in the museum of the Philadelphia Academy. None of these, unfortunately, are in that perfection of feather and coloration necessary to exhibit their true character, and I am unable to indicate these features properly, though believing them to be different from *petechia*.

The St. Croix bird, which resembles *petechia* in the yellow edges to the wing coverts, is smaller, with considerably shorter wings proportionally (2.40, instead of 2.65); the wing formula is quite different, being 3. 2. 1. 4. 5. 6, instead of 3. 4. 2. 5. 1. 6—the 1st quill being thus longer than the 4th and 5th, the 2d next to the longest, instead of the 1st being shorter than the 4th and 5th, and the 4th second in length. The St. Thomas specimens have much the same wing formula—3. 2. 4. 1. 5. 6 in most; in two, 3. 4. 2. 1. 5. 6; they are rather larger, however, with more yellow on the tail.

A specimen, in poor condition, obtained in Barbadoes by Mr. Gill, and preserved in alcohol (No. 33,766), although apparently an adult male, is of very small size: length, 4.30; wing, 2.25; tail, 2.00; and has as the wing formula, 3. 4. 5. 2. 1. The tail has almost the same amount of yellow as in *D. æstiva*, and much more than in any of its red-capped allies, viz., the entire inner webs of five exterior feathers, with exception of a terminal streak. On the outer web of the exterior feather the basal yellow does not extend quite as far up as in *æstiva*. The entire top of head is of a deep chestnut-brown. This bird, therefore, may be a different species again from those just referred to. The specimen exhibits the unusual anomaly of having seven tail-feathers on one side, and six on the other.

The solution of all the questions connected with this subject will depend upon full series of specimens in perfect spring plumage, from all the different West India Islands. It is, however, quite evident that, while *D. petechia*, of Jamaica, and *D. gundlachi* are distinct species, there is at least one, and perhaps several additional species in the West India Islands more to the eastward, perhaps one for each group of islands.

NOTE.—As the present pages are passing through the press the Institution has received a series of Golden Warblers from St. Thomas, collected by Mr. Swift, which, unfortunately, being in winter plumage, do not furnish the means of making a final comparison, though substantiating what has already been said in regard to the character of the wings.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
36,621	..	..	St. Thomas.	Winter.	Robert Swift.	.....
36,622	..	..	"	"	"	.....
36,623	..	..	"	"	"	.....

Dendroica vieilloti.

Dendroica vieilloti, CASSIN, Pr. A. N. Sc. May, 1860, 192 (Panama; Carthagena).—SCLATER, Catal. 1861, 32, no. 196 (New Grenada and Mexico).—? SALVIN, MSS. (Gulf of Nicoya).

Dendroica erithachorides, BAIRD, Birds N. Am. 1858, 283 (not of FEUILLÉE).

?Rhimanphus ruficeps, CABANIS, Jour. Orn. for Sept. 1860, 326 (published Jan. 1861; see cover) (Costa Rica).

Hab. Mexico to New Grenada.

(No. 10,211.) Above olive-green, rather brighter on the rump; beneath, including lining of wings, bright golden yellow. Entire head all round, with broad streaks on the breast and sides, orange-brown. Wings nearly black, the larger coverts, first primary, alula, and inner secondaries broadly edged with greenish-yellow; the other quills with olivaceous like the back; the insides of the quills broadly and sharply margined obliquely with yellow, which reaches the shaft on the inner secondaries, and in all the quills except the long primaries, is continued entirely around so as to join the exterior margining. Exposed surface of the tail feathers (including their outer webs) dark greenish-brown, edged externally with the color of the back, the outer feather alone having the outer web yellow, with a dark shaft streak from near the base. The inner webs of the 1st, 2d, and 3d feathers entirely yellow, except at the end; the 4th and 5th with more and more dusky along the shaft; the 6th with narrow margin only of yellow. Bill dark horn color. Legs pale.

The colors of the female are much duller; the head only tinged with brown, especially along the centres of the feathers, and the streaks on the body beneath, indistinct. The inner webs of the tail feathers show much more brown on them.

The wings, in this species, are broad and rounded, as in *petechia*. The 3d quill is longest; the 4th and then the 2d a little shorter; the 1st about intermediate between the 2d and 5th, not shorter than the 5th. The tail is considerably rounded. In five specimens the formula is 3. 4. 2. 1. 5. 6; in one, 3. 2. 4. 1. 5. 6. The difference between the 1st and 3d quills is about .19.

Total length, 5.00; wing, 2.75; tail, 2.30; width of outer feather, .35; difference between 1st and 3d quills, .13; length of bill along culmen, .50, from nostril, .35, along gape, .63; tarsus, .81; middle toe and claw, .62; hind toe and claw, .50.

This species, in the broad rounded wings, short first primary, and wide quill- and tail feathers agrees with *petechia* much more than with *æstiva*, although it is even larger, and the wings proportionally longer (including 1st quill) than *petechia*. The 1st quill, too, is

longer than the 5th, not shorter. The quills are more broadly margined than in that species, and all the colors more brilliant. The entirely red head will readily distinguish it however. The reddish streaks in the feathers of the chin, and a tinge of the same in the lores, will distinguish the female bird from all others.

The preceding remarks were based upon the types of *D. vieilloti* (all from Lt. Michler's collection), as described by Mr. Cassin. Since then I have had the opportunity of examining specimens from other localities. A series from Mazatlan exhibits some differences, but the specimens are all moulting, and it is impossible to determine their true characters. It is, however, quite in accordance with the general rule in the distribution of American birds, that a species inhabiting the main land of South America should be replaced farther north, especially so far as Mazatlan, by a second, closely allied to it. To which form, if there be two, the *ruficeps* of Cabanis belongs, it is difficult to say, as his description refers equally to specimens before him from Carthagena, Costa Rica, and Mexico; most probably, however, to the former, and as such true synonyms of *D. vieilloti*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,212	5	..	Carthagena, N. G.	...	Lt. Michler.	A. Schott.
10,211	6	♂	"	...	"	"
17,900	5	♀?	"	...	"	"
17,899	46	♂	"	...	"	"
21,767	..	Juv.	New Grenada.	...	" [Jr.	"
..	..	..	Caucun, Yucatan.	1842.	Cab. Dr. S. Cabot,	.....
33,017	280	♂	Mazatlan, Mex.	Aug. 1864.	A. J. Grayson.	.....
33,018	281	Juv. ♂	"	"	"	.....
33,019	282	♀	"	"	"	.....

(10,211.) Type. (33,017.) 5.; 7.50.

Dendroica rufigula.

Dendroica rufigula, BAIRD.

Sylvia ruficapilla, "LATH.," VIEILL. Nouv. Dict. XI, 1817, 228.—IB. Encycl. Méth. II, 1823, 442 (not of p. 440) ("Martinique").—IB. Galerie Ois. I, 268, pl. 164. (Not *ruficapilla* of GMELIN and LATHAM.)

Hab. ? West Indies; ? Martinique.

Similar to *D. vieilloti*, but smaller; the rufous of entire head extending down the neck to jugulum. Wing formula, 3. 4. 2. 1. 5. 6.

Length, 4.50; wing, 2.25; tail, 2.00; tarsus, .72; middle toe and claw, .52; hind toe and claw, .45; bill from nostril, .37.

I have already adverted to the possibility that the Brown-headed Golden Warblers of Mexico and Central America may be different

from typical *vieilloti*, from Carthagena. In the collection of the Philadelphia Academy I find a single specimen labelled "*S. rufica-pilla*," without indication of locality, which differs decidedly from all others I have seen in being much smaller, and in having the orange-brown of the head and throat extending farther down as a broad lappet over the neck to the jugulum, instead of being confined to the head alone. The lateral tail feather has perhaps less yellow on its outer web, though the markings of the tail and wings are very similar. The size is considerably less; the wings half an inch shorter; the middle toe and claw one-tenth of an inch shorter; the bill is more slender; the wing formula is the same. Of its distinction from *vieilloti* as a species I have little doubt, and can only regret the uncertainty in regard to the locality. It agrees very well, especially in the greater extension of the rufous of the throat, with the *Sylvia ruficapilla* of Vieillot, as cited above, from Martinique; and it may be really a West Indian species.

Specimen in collection of Philadelphia Academy

Dendroica olivacea.

Sylvia olivacea, GIRAUD, Birds Texas, 1841, 14, pl. vii, fig. 2.—SCLATER, P. Z. S. 1855, 66.—*Sylvicola olivacea*, CASSIN, Ill. Birds Texas, etc. 1855, 283, pl. xlviii.—*Rhimanphus olivaceus*, SCLATER, P. Z. S. 1856, 291 (Cordova).—*Dendroica olivacea*, SCLATER P. Z. S. 1858, 298 (Oaxaca; cold region).—*Dendroica olivacea*, SCLATER, P. Z. S. 1859, 363 (Jalapa).—IB. Catal. 1861, 31, no. 190.

Sylvia tæniata, DUBUS, Bull. Acad. Brux. XIV, 1847, 104.—IB. Rev. Z. 1848, 245.—*Sylvicola tæniata*, BON. Consp. 1850, 309.

Hab. Mexico (both coasts to the southward); Guatemala.

Head and neck all round, with jugulum, brownish-saffron, with a greenish tinge on the nape. Rest of upper parts ashy. Middle and tips of greater wing coverts white, forming two bands on the wing; a third white patch at the bases of the primaries (except the two outer), and extending forwards along the outer edges. Secondaries edged externally with olive green. Inner webs of quills conspicuously edged with white. Under parts, except as described, white, tinged with brownish on the sides; a narrow frontal band, and a broad stripe from this through eye and over ear coverts, black. Outer tail feather white, except at base and towards tip; greater portion of inner web of next feather also white, much more restricted on the third.

Length, 4.60; wing, 2.88; tail, 2.15; tarsus, .75.

A female specimen (14,369), perhaps also in autumnal plumage, has the saffron replaced by clear yellowish, except on top of head and nape, which are olive green. The black frontal and lateral bands are replaced by whitish, leaving only a dusky patch on the ears.

The bill in this species is quite peculiarly slender and depressed, and the culmen is straighter than in any other *Dendroica*. The nos-

trils, too, are much more linear, and the wings unusually long. In these respects, as well as in pattern of coloration, it forms a very strongly marked section among the *Dendroicas*, even if not entitled to consideration as a separate genus. The saffron brown head, neck, and breast; the narrow black forehead, with black stripe through the eye; the white belly, and the two white wing bands and white patch at base of primaries, easily characterize it specifically.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
14,369	..	♀	Mexico.	...	A. Sallè.	.....
21,374	1	♂	Popocatepetl.	...	Verreaux.	.....
32,464	391	♂	Orizaba (alpine reg.)	...	Prof. Sumichrast.	.....
30,692	253	♂	Choctum, Vera Paz.	Jan. 1862.	O. Salvin.	Salvin & Godman.

Dendroica maculosa.

Motacilla maculosa, Gm. S. N. I, 1788, 984.—*Sylvia m.* Lath.; Vieill. II, pl. 93.—Bon.; Nutt.; Aud. Orn. Biog. I, II, V, pl. 50, 123.—D'Orb. Sagra's Cuba, Ois. 1840, 72.—*Sylvicola m.* Swains.; Bon.; Aud. B. A. II, pl. 96.—*Rhimanphus m.* Cab. Jour. III, 1855, 474 (Cuba).—*Dendroica m.* Baird, Birds N. Am. 1858, 284.—Sclater, P. Z. S. 1859, 363, 373 (Xalapa).—Ib. Catal. 1861, 32, no. 197.—Bryant, Pr. Bost. Soc. VII, 1859 (Bahamas).—Sclater & Salvin, Ibis, 1859, 11 (Guatemala).—Lawrence, Ann. N. Y. Lyc. 1861, 322 (Panama; winter).—Gundlach, Cab. Jour. 1861, 326 (Cuba; very rare).

Sylvia magnolia, Wils. III, pl. 23, fig. 3.

Hab. Eastern province of North America to Fort Simpson; eastern Mexico to Guatemala and Panama; Bahamas; Cuba (very rare).

Specimens from the Eastern United States generally from the Atlantic to Missouri valley; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,634	..	♂	Moose Factory.	May 28, '60.	C. Drexler.	.....
23,627	..	..	"	...	J. MacKenzie.	.....
19,519	138	♀	Fort Simpson.	June 12, '60.	B. R. Ross.	.....
	..	..	Fort Resolution.	1860.	R. Kennicott.	.....
32,711	20,165	♂	Mexico.	...	Verreaux.	.....
22,363	32,626	..	Coban.	...	"	.....
30,691	273	..	Choctum, Vera Paz.	Feb. 1862.	O Salvin.	.....

Dendroica kirtlandii.

Sylvicola kirtlandii, Baird, Ann. N. Y. Lyc. V, June, 1852, 217, pl. vi (Cleveland, Ohio).—Cassin, Illust. I, 1855, 278, pl. 47.—*Dendroica kirtlandii*, Baird, Birds N. Am. 1858, 286.

Until recently, the only authenticated and known specimen of this species was the type, No. 4,363, killed by Dr. Kirtland, near Cleveland, Ohio, May, 1851, and prepared by myself. I have, however, lately found a second skin in the collection of Dr. Samuel Cabot, Jr., of Boston, taken at sea between the island of Abaco and Cuba. The plumage is not quite so matured as in the type, and lacks the dark spots on the jugulum; it is, however, otherwise very similar. A third specimen (female) is reported in the Ohio Farmer for June 9, 1860, as killed that season near Cleveland, and preserved by Mr. R. K. Winslow, who states that the late Wm. Case, of Cleveland, also killed a specimen, but did not preserve it. Dr. Hoy also thinks he has seen it at Racine. A careful search in the vicinity of Cleveland, about the middle of May, will probably be rewarded by the discovery of additional specimens.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,363	..	♂	Cleveland, Ohio.	May 13, '51.	S. F. Baird.	J. P. Kirtland.
..	..	..	Near Abaco, Bahamas.	...	Cab. S. Cabot, Jr.	.....

(4,363.) Type of species.

Dendroica carbonata.

Sylvia carbonata, AUD. Orn. Biog. I, 1831, 308, pl. 60 (Kentucky).—NUTT.—*Helinaia carbonata*, AUD. Syn.—IB. B. A. II, 1841, 95, pl. 109.—*Dendroica carbonata*, BAIRD, Birds N. Am. 1858, 287.

This species continues to be known only by the description and figure of Audubon.

Dendroica palmarum.

Motacilla palmarum, GMEL. S. N. I, 1788, 951 (based on Palm Warbler, LATHAM, Syn. II, p. 498, no. 131, St. Domingo).—*Sylvia p.* LATH.; VIEILLOT, II, pl. 73.—BON.; D'ORB. Sagra's Cuba, Ois. 1840, 61, pl. viii.—*Sylvicola p.* SALLÉ, P. Z. S. 1857, 231 (St. Domingo).—*Dendroica p.* BAIRD, Birds N. Am. 1858, 288.—SCLATER, Catal. 1861, 33, no. 199.—IB. P. Z. S. 1861, 71 (Jamaica; April).—BRYANT, Pr. Bost. Soc. VII, 1859 (Bahamas).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba; very common).

Sylvia petechia, WILS. VI, pl. 28, fig. 4.—BON.; NUTT.; AUD. Orn. Biog. II, pl. 163, 164.—*Sylvicola petechia*, SWAINS.; AUD. B. A. II, pl. 90.

Sylvicola ruficapilla, BON.—*Rhimanphus ruf.* CAB. Jour. III, 1855, 473 (Cuba; winter).

Hab. Eastern province of North America to Fort Simpson and Hudson's Bay; Bahamas, Jamaica, Cuba, and St. Domingo in winter. Not noted from Mexico, or Central America.

Specimens from United States generally from Atlantic to Missouri valley; also from—

Smithsonian No.	Collector's No.	Sex and Age	Locality.	When Collected.	Received from	Collected by
26,929	..	..	Stewiacke, N. S.	...	W. G. Winton.	.....
20,628	..	..	North of Montreal.	1860.	C. Drexler.	C. Drexler.
...	...	...	Ft. George, H. Bay.	1861.	Mr. Gladmon.	.....
22,642	568	♀	Fort Simpson.	"	B. R. Ross.	.....
19,508	592	♂	Fort Resolution.	June 1.	R. Kennicott.	.....
19,507	726	♀	"	June 20.	"	.....
23,521	..	..	Monte Verde, Cuba.	Jan. 27.	C. Wright.	.....
23,522	..	..	Bayamo, "	Nov. 6, '61.	"	.....
23,524	..	..	San Andre, "	Oct. 1859.	"	.....
34,249	..	♀	Remedios, "	Dec. 14, 63.	N. H. Bishop.	.....

Dendroica pityophila.

Sylvicola pityophila, GUNDLACH, Ann. N. Y. Lyc. Oct. 1855, 160 (Cuba). —*Rhimanphus pityophilus*, GUNDL. Cab. Jour. 1857, 240.

Hab. Cuba only.

Above, including sides of head and neck, uniform plumbeous gray; the forehead, vertex, and loral region olive green. Chin and fore neck bright yellow, extending on the middle of jugulum, and bordered by black streaks towards lower part of neck, most conspicuous on sides of breast. Beneath dull white, the insides of wings more ashy, the flanks something like the back. Two dull ashy white bands across the wing coverts; the quill- and tail feathers edged with paler ash than the ground color. Lateral tail feather with a whitish patch on the inner web, running forward to a point along the shaft, including the whole web at the end; second feather with a more restricted patch of the same.

Length, 4.50; wing, 2.30; tail, 2.20; culmen, .45; bill from gape, .55; tarsus, .66.

This species in general appearance somewhat resembles *D. superciliosa.* The black streaks, however, of the sides of jugulum are not continued along the flanks; the forehead and vertex, with lores, are olive green, not black and plumbeous, and there is no indication whatever of the black and white markings of the side of the head. There is also some similarity to *D. pinus;* but the plumbeous back and cheeks (not olive green), and the whitish under parts, except on throat (not greenish-yellow), will readily distinguish them.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
33,079	..	♂	Cuba.	...	Dr. J. Gundlach.	.....

Dendroica dominica.

Motacilla dominica, L. Syst. Nat. 12th ed. 1766, 334 (*Ficedula dominica cinerea*, Briss. III, 520, pl. 27, fig. 3.)—*Dendroica dominica*, Baird.

Motacilla superciliosa, Boddært, Tableau Pl. enl. 686, fig. 1, 1783.—*Dendroica superciliosa*, Baird, Birds N. Am. 1858, 289.—Sclater, P. Z. S. 1859, 363 (Xalapa); 373 (Oaxaca); 1861 (Jamaica); 1863, 368 (Mexico).—Ib. Catal. 1861, 33, no. 200.—Sclater & Salvin, Ibis, 1860, 274 (Duenas, Guat., Sept.).—March, Pr. A. N. Sc. 1863, 293 (Jamaica).—Gundlach, Cab. Jour. 1861, 326 (Cuba; very common).

Motacilla flavicollis, Gmelin, S. N. I, 1788, 959.—*Sylvia fl.* Lath.; Wils. II, pl. xii, fig. 6.—? Vieillot, Encycl. Méth. II, 1823, 453.

Motacilla pensilis, Gmelin, S. N. I, 1788, 960.—*Sylvia p.* Lath.; Vieill. II, pl. 72 (St. Domingo).—Bon.; Aud. Orn. Biog. I, pl. 85; Nutt.; D'Orb. Sagra's Cuba, Ois. 1840, 65.—*Sylvicola pens.* Rich.; Bon.; Aud. B. A. II, pl. 79,—Gosse, Birds Jam. 1847, 156 (Jamaica).—*Rhimanphus pens.* Cab. Jour. III, 474 (Cuba).

Other Localities: *Cordova*, Sclater, P. Z. S. 1856, 291; *St. Domingo*, Sallé, P. Z. S. 1857, 231; *Jamaica*, Gosse, Birds Jam. 156.

Hab. Eastern province of U. S., north to Washington and Cleveland; in winter abundant in Cuba; St. Domingo and Jamaica; Mexico (as far north as Colima on west coast) and Guatemala. Resident in Jamaica?

Specimens from the West Indies exhibit the same variations in the extent of black on the forehead, and in the color of the superciliary stripe, as North American. The portion of this stripe anterior to the eye is sometimes white, sometimes bright yellow, and sometimes a mixture of the two; but I am entirely unable to base a second species upon such diversities. All I have seen from Mexico and Guatemala have this stripe white. There is a great variation in the length of the bills in different specimens.

There can be no doubt that this is the *Motacilla dominica* of Linnæus.

This species, although not belonging to either the middle or western provinces of North America, was collected at Colima (west coast of Mexico), by Mr. Xantus. This is an interesting fact, but paralleled by the occurrence at Manzanillo, Mex. (the seaport of Colima), of *Larus atricilla* and *Sterna antillarum* (*frenata*), two species not known farther north on the Pacific coast, although occurring along the whole eastern coast of the United States. A specimen, killed June 4, by Mr. March, in Jamaica, would indicate that it breeds in that island, as well perhaps as in others of the West Indies.

14 April, 1865.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,098	..	♀?	Washington, D. C.	1842.	S. F. Baird.	W. M. Baird.
3,323	..	..	Liberty County, Ga.	1846.	"	W. L. Jones.
7,709	..	..	Cleveland, Ohio.	May, 1849.	Dr. Kirtland.	Dr. Kirtland.
10,179	..	..	Cairo, Ill.	April 29.	R. Kennicott.	R. Kennicott.
23,527	..	♂	N. Sophie, Cuba.	Jan. 25, '61.	C. Wright.	C. Wright.
23,528	..	♂	Monte Verde, Cuba.	Jan. 16, '61.	"	"
26,807	37	♂	Spanishtown, Jam.	June 4, '62.	W. T. March.	W. T. March.
24,342	..	♀	"	Nov. 1861.	"	"
3,986	74	♀	Tamaulipas, Mex.	...	Lt. Couch.	Lt. Couch.
31,824	2,043	♂	Near Colima, Mex.	Sept. 1863.	John Xantus.	John Xantus.
35,036	1,705	..	"	Aug. 1863.	"	.....
30,690	274	..	Duenas, Guat.	Sept. 29, '59.	O. Salvin.	.....

Dendroica graciæ.

Dendroica graciæ, COUES, MSS.

Hab. Fort Whipple, near Prescott, Arizona.

(No. 36,988, ♂?) Bill shorter than the head; gonys slightly convex. Color of upper parts, with sides of neck, ash-gray; the middle of back, and less conspicuously, the upper tail coverts, streaked with black. A line from nostrils to above the eye (passing into white for a short distance behind it), eyelids, a crescentic patch beneath the eye, the chin, throat, and centre of jugulum, bright yellow; the rest of under parts, including inside of wing, axillars, and tibiæ, white; the border of the yellow, and the sides of body streaked with black. A line from bill, through the eye, the cheeks (inclosing the yellow crescent), the sides of the vertex, the forehead, and the centres of feathers on top of head, blackish. Wings and tail blackish, the outer edges of the larger feathers pale bluish-gray; two white bands across the wing coverts. Lateral tail feather white, except the inner web at extreme base, the shaft, and a narrow streak at the end of the outer web; the next feather similar, but the basal blackish extending farther along 3d feather with edge of outer web, and a wedge-shaped patch in end of inner web, only, white.

Autumnal specimens similar; the black markings less distinct; the back tinged with olivaceous.

Very young birds do not differ materially from the adult, showing nothing of the spotting and mottling of the *Turdidæ*.

Total length (fresh specimen before being skinned), 5.00; expanse of wings, 8.00. Total length (prepared specimen), 4.60; wing, 2.75; tail, 2.30; length of bill from forehead, .50, from nostril, .30; along gape, .56; tarsus, .65; middle toe and claw, .52; claw alone, .16; hind toe and claw, .40; claw alone, .19.

This interesting new species, recently discovered in Arizona, by Dr. Coues, and named by him after a member of his family, is almost exactly like *D. nigrescens* in the color and markings of the back (with its blackish interscapular streaks), wings, and tail, as well as of the under parts, except that the chin and throat are

yellow, margined with black, instead of black margined with white. The heads are very differently marked. To *D. dominica* there is a strong resemblance, except that the infra-ocular crescent and eyelids are yellow, not white; the black of sides of head is much less extensive, and without the conspicuous white patch behind it. There is much more white on the tail; the back is streaked with black; the bill is shorter and straighter, and the size much less.

The relationship to *D. adelaidæ*, Baird, is much closer, however, than to any other species. The proportions are rather different—the wings, tail, and toes being considerably longer; the bills precisely similar. The coloration and marking of the upper parts, and of the head, are almost precisely the same, perhaps even to the dorsal streaks, very obsoletely visible in the winter specimens of *adelaidæ*. The yellow, however, of the under parts does not extend beyond the jugulum, where it is abruptly defined, instead of spreading over the whole under parts, excepting perhaps the crissum. *D. adelaidæ*, too, lacks the conspicuous black streaks of the sides; and the white of the outer tail feather is merely a quadrate patch in the terminal half of the inner web.

This species appears to be abundant in Arizona, not less than ten specimens having been collected by Dr. Coues, though mostly in very indifferent plumage, owing to the season.

Of the four species, just referred to, the *D. nigrescens* is readily distinguished by the black chin and throat; the diagnostic characters of the other three will be as follows:—

Common Characters.—Upper parts ash gray, the forehead and sides of vertex black. A line from nostril to above eye (passing into white behind), chin, and throat, yellow, margined laterally with blackish; crissum, inside of wings, axillars, and two bands on wing, white.

Superciliary line extending to the nape, and white, excepting anterior to the eye. Cheeks black, separated from the ash of the neck by a white patch. Eyelids and infra-ocular crescent white. Back not streaked. Bill lengthened, gonys almost concave.

Yellow confined to jugulum; rest of under parts white; the sides streaked with black . . . *dominica.*

Superciliary line scarcely extending beyond the eye, and yellow, excepting at extreme end. Cheeks ashy, like sides of neck; dusky only near the eye, and not bordered on side of neck behind by white. Eyelids and infra-ocular crescent yellow. Back streaked. Bill short, gonys slightly convex.

Yellow of under parts confined to jugulum; rest of under parts white; the sides streaked with black . . . . . *graciæ.*

Yellow of under parts extending to crissum. Sides scarcely streaked . . . . . *adelaidæ.*

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
36,984	655	♂	Fort Whipple, near	Oct. 29, '64.	Dr. E. Coues.	5.20; 8.40
36,985	570	♂	" [Prescott, Ar.	Aug. 13, '64.	"	5.20; 8.00
36,986	567	..	"	"	"	5.10; 7.80
36,987	568	..	"	"	"	5.20; 7.90
36,988	534	..	"	Aug. 11	"	5.00; 8.00
36,989	569	..	"	Aug. 13.	"	4.70; 7.80
36,990	535	..	"	Aug. 11.	"	4.90; 7.70
36,991	597	♂	"	Aug. 15.	"	4.85; 7.80
36,992	536	..	"	Aug. 11.	"	.....
36,993	433	♂	20 miles S. from Ft. [Wingate, Ar.	July 2, '64.	"	5.30; 7.90

(36,988.) Type. (36,993.) Iris, bill, and feet black; soles yellow.

Dendroica adelaidæ.

Dendroica adelaidæ, BAIRD.

Hab. Porto Rico.

(No. 36,486.) Entire upper parts, and sides of neck as far forward as the eyes, uniform ash gray. Beneath, including edge of bend of wing, bright yellow; lining of wings, axillars, and crissum, white. A broad yellow line from bill to eye, with the eyelids yellow; forehead and sides of vertex black. A black loral line. Wings with two conspicuous white bands; the quills and tail feathers blackish, edged externally with whitish, internally with purer white. Three lateral tail feathers with a quadrate terminal white patch on inner web. Bill black. Legs pale yellowish.

Total length, 4.70 (estimated); wing, 2.10; tail, 2.05; lateral feather .20 shorter than middle; difference of longest primary and 9th, .35; length of bill from forehead, .50, from nostril, 30; along gape, .55; tarsus, .65; middle toe and claw, .51; claw alone, .17; hind toe and claw, .39; claw alone, .18.

The ashy feathers of forehead have a central streak of black, seen also to less extent in the crown. The cheeks below and behind the eye are ashy like the neck above. There is a slight appearance of a black line or patch separating the yellow and ashy on the side of the neck, and of a central blackish streak in the yellow feathers of the side of the breast. The sides of body are more olivaceous, with very obsolete indications of dusky streaks. The yellow of belly becomes paler towards the anus, and passes into the white of crissum and tibiæ. The wings and tail are almost black; the edging of the secondaries is more olivaceous, of the primaries more whitish, especially towards the end. The white internal edging is very distinct. The anterior border of the white caudal patch is straight and per-

pendicular to the shaft, the patch covering the posterior two-fifths of the feather; on the 3d feather it is confined to the tip. The yellow stripe to the eye is continued a short distance beyond it, but becomes white.

It is quite possible that mature spring male specimens have the middle of the back streaked with dusky, as in *D. graciæ* and *townsendii*.

This interesting new species of Warbler has several peculiarities of form which almost entitles it to rank as a type of a separate genus. The anterior toes are very short, quite like *Parula*, which also it resembles somewhat in coloration, but the wings are too short, and the bill not conical enough. In fact, bill and feet are much as in *Dendroica maculosa*. The wings, however, differ in being much shorter, less pointed, and more rounded. The tail, also, is much rounded. The nape shows quite a number of long bristles, with fibrillæ at the end, which I have not noticed elsewhere among the Warblers.

The relationships of the species, as far as coloration is concerned, are to *D. graciæ*, Coues, and *D. dominica*, as shown in the preceding article.

I have much pleasure in dedicating this new species to the daughter of Mr. Robert Swift, of St. Thomas, a gentleman to whom the Smithsonian Institution is indebted for a very important collection of the birds of St. Thomas and Porto Rico, made solely at his expense, to be used in preparing the present work.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
36,486	..	..	Porto Rico.	Jan. 1865.	Robert Swift.	.....

(36,486.) Type.

Dendroica discolor.

Sylvia discolor, VIEILL. Ois. Am. Sept. II, 1807, 37, pl. 98.—BON.; AUD. Orn. Biog. I, pl. 14; NUTT.—LEMBEYE, Aves Cuba, 1850, 32, pl. vi, fig. 2.—*Sylvicola discolor*, JARD.; RICH.; BON.; AUD. B. A. II, pl. 97.—GOSSE, Birds Jam. 1847, 159.—*Rhimanphus discolor*, CAB. Jour. III, 1855, 474 (Cuba; winter).—*Dendroica discolor*, BAIRD, Birds N. Am. 1858, 290.—SCLATER, Catal. 1861, 33, no. 201.—NEWTON, Ibis, 1859, 144 (St. Croix).—BRYANT, Pr. Bost. Soc. VII, 1859 (Bahamas).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba; very common)

Sylvia minuta, WILSON, III, pl. 25, fig. 4.

Hab. Atlantic region of U. S., north to Massachusetts; in winter very

abundant throughout all the West India Islands, as far at least as the Virgin Islands. Not recorded from Mexico or Central America.

Specimens from the Atlantic slope only of the United States as far north as Massachusetts; also from—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	..	..	Bahamas.	April, 1864.	Lt. Fitzgerald.	.....
26,813	40	♂	Spanishtown, Jam.	June 14, '62.	W. T. March.	W. T. March.
24,350	40	♀	"	...	"	"
23,316	43	♀	Trelawney, Jam.	Jan. 10, '57.	P. L. Sclater.	W. Osburn.
32,710	44,844	♂	Martinique.	...	Verreaux.	.....
36,481	..	..	Porto Rico.	Winter '64.	Robert Swift.	.....
26,975	..	..	St. Thomas.	...	J. Ackhurst.	.....
66,627	..	..	"	...	Robert Swift. [ton.	.....
..	..	..	St. Croix.	...	Cab. A. & E. New-	.....

SUBFAMILY GEOTHLYPINÆ.

SEIURUS, SWAINSON.

Seiurus, SWAINSON, Zool. Jour. 1827, 171. (Type *Motacilla auricapilla*, L.)
Enicocichla, GRAY, List Genera, 1840. (*Henicocichla*, AG.)

Seiurus aurocapillus.

Motacilla aurocapilla, LINN. S. N. I, 1766, 334.—*Turdus aur.* LATH.; WILS. Am. Orn. II, pl. xiv, fig. 2.—AUD. Orn. Biog. II, pl. cxliii.—*Sylvia aur.* BON.—*Seiurus aur.* SWAINSON, Zool. Jour. III, 1827, 171.—BAIRD, Birds N. Am. 1858, 260.—MOORE, P. Z. S. 1859, 55 (Honduras).—MAX. Cab. Jour. 1858, 177.—JONES, Nat. Bermuda, 27.—*Henicocichla aur.* SCLATER, Catal. 1861, 25, no. 159.—GUNDLACH, Cab. Jour. 1861, 326 (Cuba).—*Seiurus aur.* D'ORB. Sagra's Cuba, 1840, 55.

Turdus coronatus, VIEILL. Ois. II, 1807, 8.

OTHER LOCALITIES QUOTED.—*Cordova*, SCLATER, P. Z. S. 1856, 293.—*St. Domingo*, SALLÉ, P. Z. S. 1857, 231.—*Guatemala*, SCLATER & SALVIN, Ibis, I, 1859, 10.—*Santa Cruz* (winter), NEWTON, Ibis, 1859, 142.—*Cuba* (winter), Cab. Jour. III, 471.—*Jamaica*, GOSSE, Birds, 152.—SCLATER, P. Z. S. 1861, 70.—*Costa Rica*, CAB. Jour. 1861, 84.

Hab. Eastern province of North America, north to English River, H. B. T.; whole West Indies; eastern Mexico; Honduras, Guatemala, and Costa Rica; Bermuda in autumn and winter (*Jones*).

I do not observe any special difference between skins of this species from a wide range of localities, excepting that those from the Mississippi Valley appear larger, with proportionally longer wings. The Jamaican, Mexican, and Central American are rather smaller than the average; the Cuban exhibit both extremes.

Specimens have been received from various localities in the whole eastern United States, as far west as the mouth of the Platte, or beginning of the high plains, and as far north as English River, H. B. T. (July 15, Kennicott). The extra-limital localities are as follow:—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,501	21	..	Nassau, N. P.	May 14, '64.	Lt. C. L. Fitzgerald.	.....
29,617	..	♀	Fermina, Cuba.	Feb. 18.	C. Wright.	C. Wright.
24,366	34	♂	Spanishtown, Jam.	Nov. 4, '61.	W. T. March.	W. T. March.
24,367	..	♀	"	"	"	"
23,305	..	♂	Long Hall, Jam.	March 11.	P. L. Sclater. [ton.	W. Osburn.
..	..	..	St. Croix.	March 13.	Cab. A. & E. New-	.....
36,629	..	..	St. Thomas.	Winter '64.	Robert Swift.	.....
32,461	366	..	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.
32,695	32,618	♂	Coban, Guat.	...	Verreaux.	.....
30,662	3,792	♂	Choctum, Guat.	Feb. 1862.	O. Salvin.	Salvin & Godman.
30,663	162	..	Savaña Grande, Guat	1862.	"	"
34,647	..	..	Barrauca, C. R.	April 16, '64.	J. Carmiol.	.....

Seiurus noveboracensis.

Motacilla noveboracensis, GMELIN, S. N. I, 1788, 958.—*Sylvia nov.* LATH.; VIEILLOT, Ois. Am. Sept. II, pl. lxxxii.—*Seiurus nov.* NUTT.; BON.; AUD. B. A. III, pl. 199.—BAIRD, Birds N. Am. 1858, 261, pl. lxxx, fig. 1.—MAX. Cab. Jour. 1858, 121.—*Henicocichla nov.* CAB. Schom. Guiana, III, 666; Jour. 1860, 324 (Costa Rica).—SCLATER, Catal. 1861, 25, no. 161 (Tobago).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba).—*Mniotilta nov.* GRAY.

??Motacilla fuscescens, GMELIN, S. N. 984 (based on *Ficedula jamaicensis*, BRISSON, III, 512, Jamaica).

Turdus aquaticus, WILS. Am. Orn. III, 1811, pl. xxii, fig. 5.—AUD. Orn. Biog. 1839, 284, pl. 433.

Sylvia anthoides, VIEILLOT, Nouv. Dict. XI, 1817, 208.—*Seiurus tenuirostris*, SW. 1827; GAMB.—*Seiurus sulfurascens*, D'ORBIGNY, Sagra's Cuba, 1840, 57, pl. vi.—*Seiurus gossii*, BON. Consp. 1850, 306 (Jamaica).—*?Anthus l'herminieri*, LESS. Rev. Z. 1839, 101 (Colombia).

OTHER LOCALITIES QUOTED: *Xalapa*, SCLATER, P. Z. S. 1859, 363.—*Guatemala*, SCLATER & SALVIN, Ibis, 1859, 10.—*Panama*, LAWRENCE, Ann. N. Y. Lyc. 1861, 322.—*Carthagena*, CASSIN, Pr. A. N. Sc. 1860, 191.—*Santa Cruz* (winter), NEWTON, Ibis, 1859, 142.—*Cuba*, CAB. Jour. III, 471.—*Jamaica*, GOSSE, Birds, 151.—SCL. P. Z. S. 1861, 70.

Hab. Eastern province of North America, north to Arctic Ocean and Yukon, (westward along northern border of U. S. to Cascade Mountains); whole West Indies; southeastern Mexico; all Central America; Panama and eastern South America (Bogota; Carthagena; Brazil).

The examination of a large series of specimens, from widely remote localities, reveals differences of but little moment. Some skins from Jamaica, killed in August, agree exactly in the strong

sulphur yellow tinge beneath, and ochry superciliary stripe, as well as in other characters, with autumnal Carlisle specimens, while others are much paler. Generally in spring the belly is paler in color, and the streaks better defined, the eye stripe purer; in autumn more sulphuraceous; while later in the winter the colors appear to become paler and more like the spring plumage.

Skins from Guatemala, and one labelled as from Brazil, have the concealed median yellowish patch at the base of the forehead rather more distinct than in North American ones; the under parts, especially the crissum, with the superciliary stripe, paler, nearly white, and the streaks apparently encroaching less on the belly. These characters, however, are matched separately in North American skins, and may be merely a peculiarity of winter dress.

A very young bird (22,619), from the north, has the feathers of upper parts, including wing coverts, distinctly tipped with brownish-yellow; the sub-terminal portion very dark. In a still older specimen, the only difference from the adult is in the presence of dusky spots on the back, with scattered specks of yellowish.

No North American bird exceeds the present in the extent of its range: from the Arctic Ocean in the north, to New Grenada and Brazil to the south.

Specimens from many localities throughout the whole United States from the Atlantic coast to the Missouri River, and north almost to the shores of the Arctic Ocean. Those from points west of this, and from regions beyond the limits of the United States, are as follow:—

Smithsonian No	Collector's No	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,245	1,328	♀	Youkon River.	June 15, '61.	R. Kennicott.	R. Kennicott.
27,246	1,536	..	150 miles S. W. from Youkou.	...	"	.....
28,062	1,690	♀	Fort Norman.	...	B. R. Ross.	N. Taylor.
31,121	70	..	Fort, Peel's River.	June 8.	C. P. Gaudet.	C. P. Gaudet.
27,239	1,362	..	Fort Simpson.	June	B. R. Ross.	B. R. Ross.
27,233	1,523	..	Fort Rae.	"	L. Clarke, Jr.	.....
20,625	..	♂	Moose Factory.	May 28, '60.	C. Drexler.	.....
22,039	70	♀	Heilgate, Idaho.	Aug. 26, '60.	Dr. J. G. Cooper.	Dr J. G. Cooper.
21,922	..	0.	Camp Moogie, W. T.	July 24, '60.	A. Campbell.	Dr. Kennerly.
23,304	18	♂	Savannah le Mar.	Aug. 28, '58	P. L. Sclater.	W. Osburn.
36,630	..	..	St. Thomas.	Winter '64.	Robert Swift.	.....
24,368	33	♂	Spanishtown, Jam.	Nov. 4, '61.	W. T. March. [ton.	W. T. March.
..	..	..	St. Croix.	Mar. 23, '58	Cab. A. & E. New-	.....
28,025	..	..	Mirador, Mex.	...	Dr. Sartorius.	.....
18,566	..	..	Guatemala.	...	Dr. Sclater.	.....
30,664	3,050	..	Belize, Hond.	Dec. 14, '57.	O. Salvin.	.....
24,304	..	..	Nicaragua.	...	Capt. J. M. Dow.	.....
33,267	..	..	San Jose, C. R.	...	J. Carmiol.	.....
34,648	..	..	Angostura, C. R.	Mar. 13, '64.	"	.....
21,754	39	..	Carthagena, N. G.	...	Lt. Michler.	A. Schott.
7,639	..	..	Brazil.	...	S. F. Baird.	.....

Seiurus ludovicianus.

Turdus ludovicianus, AUD. Orn. Biog. I, 1832, 99, pl. xix.—*Seiurus ludovicianus*, BON.—BAIRD, Birds N. Am. 1858, 262, pl. lxxx, fig. 2.—SCLATER, P. Z. S. 1859, 363 (Xalapa); 373 (Oaxaca); 1861, 70 (Jamaica).—SCLATER & SALVIN, Ibis, 1860, 273 (Guatemala).—*Henicocichla lud.* SCLATER, Catal. 1861, 25, no. 161 (Orizaba).

?*Turdus motacilla*, VIEILL. Ois. Am. Sept. II, 1807, 9, pl. 65 (Kentucky). (Can hardly refer to anything else; still, markings of side of head very different.)—*Seiurus motacilla*, BON. 1850.—*Henicocichla mot.* CAB. Jour. 1857, 240 (Cuba).—GUNDLACH, Jour. Orn. 1861, 326.

Henicocichla major, CAB. Mus. Hein. 1850 (Xalapa).

Hab. Eastern province of United States, as far north as Carlisle, Pa., and Michigan; Cuba and Jamaica; southern Mexico (Colima) to Guatemala.

Most specimens of this bird from the West Indies, and regions south of the United States, exhibit a decided ochraceous wash on the sides and crissum, quite marked in comparison with northern skins. I am, however, inclined to consider this a condition of late autumnal plumage, as it is most strongly marked in a specimen from Cuba, collected in October, by Mr. Wright; while another killed in the middle of January is quite as free from an ochraceous wash as spring specimens from Carlisle and Washington.

This species, formerly considered very rare, has been taken, during the past few years, about Washington, in considerable numbers by Messrs. Prentiss and Coues. They have also found *Turdus aliciæ* abundant in the same time—a species only detected and distinguished from *T. swainsoni* in 1858.

Specimens from numerous localities in the United States as far north as Carlisle, Pa., and Ann Arbor, Mich., and west to Independence, Mo. Extra-limital localities are—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,514	..	♂	Monte Verde, Cuba.	Jan. 17.	C. Wright.	.....
21,674	..	♂	Tuabuque, Cuba.	Oct. 9.	"	.....
23,303	..	♀	Trelawney, Jam.	Sept. 5, '59.	Dr. Sclater.	W. Osburn.
33,577	139	♂	Mirador, Mex.	Sept. 1863.	Dr. C. Sartorius.	.....
28,024	14	..	"	...	"	.....
29,362	119	♂	Colima.	Feb. 1863.	John Xantus.	.....
30,665	..	..	Duenas, Guat.	1862.	O. Salvin.	.....

OPORORNIS, Baird.

Oporornis, Baird, Birds N. Am. 1858, 246. (Type *Sylvia agilis*, Wils.)

Oporornis agilis.

Sylvia agilis, Wils. Am. Orn. V, 1812, 64, pl. xxxix, fig. 4.—Aud. Orn. Biog. II, pl. 138; Bon.—*Sylvicola ag.* Jard.; Aud. B. A. II, pl. 99.—*Trichas ag.* Nutt.—*Oporornis ag.* Baird, Birds N. Am. 1858, 246, pl. lxxix, fig. 2.—*? Trichas tephrocotis*, Nutt. Man. 2d ed. 1840, 462 (Chester Co., Penn.).

Hab. Eastern province of United States.

A specimen in the collection of the Philadelphia Academy, killed by Mr. Krider, has the darker ash of the jugulum of a decided sooty tinge.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,235	..	..	Philadelphia.	Oct 1, '43.	S. F. Baird.	.....
2,309	..	♂	Carlisle, Pa.	May 20, '45	"	S. F. Baird.
20,876	..	..	London Co., Va.	...	N. Janney.	.....
31,020	..	♂	Washington.	Sept. 25, '61.	C. E. Schmidt.	C. E. Schmidt.
12,815	..	♂	Racine, Wisc.	May, 1856.	Dr. Hoy.	Dr. Hoy.
35,031	..	♂	Cook Co., Ill.	May 23, '64.	R. Kennicott.	R. Kennicott.

(35,031.) 5.20; 6.90; 2.90.

Oporornis formosus.

? Sylvia æquinoctialis, Vieill. Ois. Am. Sept. II, 1807, 26, pl. 81, Penn. (not of Gmelin).

Sylvia formosa, Wils. Am. Orn. III. 1811, 85, pl. xxv, fig. 3.—Nutt.; Aud. Orn. Biog. I, pl. 38.—*Sylvicola formosa*, Jard.; Rich.; Bon.; Max. Cab. Jour. VI, 1858, 113.—*Myiodioctes formosus*, Aud. Syn.—Ib. B. A. II, pl. 74.—Lembeye, Av. Cuba, 1850, 37.—Gundlach, Cab. Jour. 1861, 326 (Cuba).—*Oporornis formosus*, Baird, Birds N. Am. 1858, 247.—Sclater & Salvin, Ibis, I, 1859, 10 (Guatemala).

Other Localities Cited: *Cuba*, Cab. Jour. III, 472.—*Mexico*, Sclater, Pr. 1862, 19.—*Isthmus Panama*, Lawrence, Ann. N. Y. Lyc. VII, 62.

Hab. Eastern province of United States, north to Washington and Chicago; Cuba, Guatemala, and Isthmus Panama. Not recorded from Jamaica and Mexico.

The *Sylvia æquinoctialis* of Vieillot (but not of Gmelin, which is *Geothlypis æquinoct.*) probably belongs here. The name, however, is geographically inapplicable, and cannot be retained.

Seiurus ludovicianus.

Turdus ludovicianus, AUD. Orn. Biog. I, 1832, 99, pl. xix.—*Seiurus ludovicianus*, BON.—BAIRD, Birds N. Am. 1858, 262, pl. lxxx, fig. 2.—SCLATER, P. Z. S. 1859, 363 (Xalapa); 373 (Oaxaca); 1861, 70 (Jamaica).—SCLATER & SALVIN, Ibis, 1860, 273 (Guatemala).—*Henicocichla lud.* SCLATER, Catal. 1861, 25, no. 161 (Orizaba).

?*Turdus motacilla*, VIEILL. Ois. Am. Sept. II, 1807, 9, pl. 65 (Kentucky). (Can hardly refer to anything else; still, markings of side of head very different.)—*Seiurus motacilla*, BON. 1850.—*Henicocichla mot.* CAB. Jour. 1857, 240 (Cuba).—GUNDLACH, Jour. Orn. 1861, 326.

Henicocichla major, CAB. Mus. Hein. 1850 (Xalapa).

Hab. Eastern province of United States, as far north as Carlisle, Pa., and Michigan; Cuba and Jamaica; southern Mexico (Colima) to Guatemala.

Most specimens of this bird from the West Indies, and regions south of the United States, exhibit a decided ochraceous wash on the sides and crissum, quite marked in comparison with northern skins. I am, however, inclined to consider this a condition of late autumnal plumage, as it is most strongly marked in a specimen from Cuba, collected in October, by Mr. Wright; while another killed in the middle of January is quite as free from an ochraceous wash as spring specimens from Carlisle and Washington.

This species, formerly considered very rare, has been taken, during the past few years, about Washington, in considerable numbers by Messrs. Prentiss and Coues. They have also found *Turdus aliciæ* abundant in the same time—a species only detected and distinguished from *T. swainsoni* in 1858.

Specimens from numerous localities in the United States as far north as Carlisle, Pa., and Ann Arbor, Mich., and west to Independence, Mo. Extra-limital localities are—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,514	..	♂	Monte Verde, Cuba.	Jan. 17.	C. Wright.	.....
21,674	..	♂	Tuabuque, Cuba.	Oct. 9.	"	.....
23,303	..	♀	Trelawney, Jam.	Sept. 5, '59.	Dr. Sclater.	W. Osburn.
33,577	139	♂	Mirador, Mex.	Sept. 1863.	Dr. C. Sartorius.	.....
28,024	14	..	"	...	"	.....
29,382	119	♂	Colima.	Feb. 1863.	John Xantus.	.....
30,665	..	..	Duenas, Guat.	1862.	O. Salvin.	.....

tance from nostrils to tip; culmen gently curved. Ash of head contracted, and confined to the vertex; the olive of nape extending to the black of the ears . . . . *æquinoctialis.*

The black of face confined to loral region, and just below eye, or extending only in a narrow ring behind it. Eyelids white?

Bill very stout; height more than half the distance from nostrils to tip; culmen much curved. Ash of head extending over nape and sides of head behind the eyes, and including ear coverts . . . . . *poliocephala.*

No distinct frontal black band. Head and neck all round, with jugulum, ashy; the feathers on the lower throat and jugulum blackish in the centres. Rest of under parts yellow.

Loral region dusky only; space round the eye blackish, without white feathers . . . *philadelphia.*

Loral region blackish; eyes with a patch of white feathers on upper and lower lids . . . *macgillivrayi.*

Geothlypis trichas.

Turdus trichas, Linn. S. N. 1766, 293.—*Sylvia trichas*, Lath.; Aud., etc. —D'Orb. La Sagra's Cuba, Ois. 1840, 67.—*Geothlypis trichas*, Cab. Mus. Hein. 1850, 16.—Baird, Birds N. Am. 241.—Gundlach, Cab. Jour. 1861, 326 (Cuba).—Sclater, Catal. 1861, 27, no. 167.—March, Pr. A. N. Sc. 1863, 293.—Lord, Pr. R. Art. Inst. Woolwich, IV, 1864, 115 (N. W. Boundary).—Jones, Nat. Bermuda, 29.

Sylvia marilandica, Wilson.—*Trichas mar.* Bon.

Regulus mystaceus, Stephens.—*Trichas personatus*, Swainson.—*Sylvia roscoe*, Aud.—*Trichas brachydactylus*, Swains.

Other Localities Quoted: *Xalapa*, *Oaxaca*, *Cordova*, Scl.—*Guatemala*, Scl. & Salv.—*Bahamas*, Bryant.

Figures: Vieill. Ois. II, pl. 28, 29.—Aud. Orn. Biog. I, II, V, pl. 23, 102, 240.—Wils. I, pl. vi, fig. 1.—Buffon, Pl. enl. 709, fig. 2.

Hab. The whole United States, from Atlantic to Pacific, and south to Guatemala, Bermuda (October); Bahamas; Cuba; Jamaica.

(No. 26,024, ♂.) Wings a little shorter than the somewhat graduated tail. Bill slender, the depth contained about two and a half times in distance from nostrils to tip. First quill about equal to seventh. Forehead to above the anterior edge of the eye, and across the entire cheeks, ears, and jaws, and ending in an angle on sides of neck, black, with a suffusion of hoary bluish-gray behind it on the crown and sides of neck; the occipital and nuchal region grayish-brown, passing insensibly into the olive green of the upper parts. Chin, throat, jugulum, edge of wing and crissum, rich yellow (the latter paler); rest of under parts, with lining of wings, yellowish-white, th sides tinged with brownish; outer primary edged with whitish, the others with olive green. Bill black; legs yellowish.

Total length, 4.40; wing, 2.15; tail, 2.30; graduation, .25; width of outer tail feather, .28; difference between 1st and 3d quills, .15; length of bill from forehead, .52, from nostril, .30; along gape, .60; tarsus, .75; middle toe and claw, .66; claw alone, .18; hind toe and claw, .48; claw alone, .26.

In autumnal plumage the whitish of the belly becomes tinged with yellowish, affording but little distinction from the yellow of the breast and crissum. The black becomes obscured, especially that on top of the head, by the extension forward of the brownish of the vertex. The eyelids are apt to show a whitish ring. There appears to be a tendency in the bill to become lighter colored, especially the lower mandible, as in *Icteria*. I have not yet seen an autumnal male with the black bill so characteristic of spring specimens.

Specimens vary in the width of the black forehead, in that of the hoary gray behind it; the whole crown being sometimes of the latter color, and the occiput behind it.

In some western specimens the size is a little larger, and the bill appears considerably stouter than in the eastern, but I cannot see any other difference.

West Indian, Mexican, and Guatemalan specimens do not present appreciable differences, except what arises from their autumnal dress; all have the paler bills referred to above.

The female bird either lacks the black mask entirely, or else it is only appreciable on the sides of the head; the whole top of the head is usually strongly tinged with reddish-olive. The feathers on the eyelids are generally whitish in the female and autumnal male, quite different from the pure black of the spring male.

I find considerable difference in specimens of this species, both as to size and extent to which the yellow of the breast reaches over the abdomen, etc. In some the black frontal band is bordered behind by a narrow band of gray, abruptly defined against the olive of the crown (2,535); in others it is of greater extent, and shades more insensibly into the olive. In 10,957, from Fort Bridger, and some others, this gray is nearly white, and as broad as or broader than the black. I am, however, unable to see any permanent characters looking to a separation into two species. The characters assigned by Swainson for his *Trichas brachydactylus*, as distinguished from *T. personatus*, appear to be common to all specimens of Maryland Yellowthroat I have ever seen.

All specimens from Washington appear smaller, with slenderer bills than others.

As this species is found distributed throughout the entire extent of the United States, from the Atlantic to the Pacific coast, and up

to its northern boundary, I do not present the special localities of any but extra-limital specimens.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,333	..	♂	Monte Verde, Cuba.	Jan. 16, 61.	C. Wright.	.....
34,271	..	♂	Remedios, Cuba.	Dec. 14, '63.	N. H. Bishop.	.....
23,318	18	♂	Trelawney, Jam.	April 20, '59.	Dr. Sclater.	W. Osburn.
24,359	31	♀	Spanishtown, Jam.	...	W. T. March.	W. T. March.
24,358	"	♂	"	...	"	"
26,806	"	..	"	May 10, '62.	"	"
16,950	3,037	♀	Cape St. Lucas.	Oct. 1.	John Xantus.	John Xantus.
26,371	..	..	Mexico.	...	J. Krider.	.....
36,510	50	♂	Merida, Yuc.	Dec. 22, '64.	Gov. Salazar.	Dr. A. Schott.
30,678	193	..	Coban, Vera Paz.	Jan. 1860.	O. Salvin.	Salv. & Godman.
30,679	3,164	..	Choctan, Vera Paz.	Jan. 1861.	"	"

Geothlypis melanops.

Geothlypis melanops, BAIRD, n. s.

Hab. Eastern Mexico.

(No. 26,372, ♂.) Bill slender, conical; culmen nearly straight to the gently decurved tip. First quill about equal to the 7th. Tail considerably graduated; the feathers broad.

Color much as in *G. trichas*, with a similar black mask, crossing the forehead and passing over the cheeks and ears, through the eyes. This black mask is, however, bordered internally and above for nearly its own width by white, very faintly tinged with bluish, the nape only in fact being tinged with olive brown. The rest of the upper parts are olive green. All the under parts are pure rich uniform yellow, even including the middle of belly, the edge and the inside of wings; the sides of body are somewhat tinged with brownish. Bill black; legs yellowish.

Total length, 5.00; wing, 2.44; tail, 2.60; graduation, .41; width of outer feather, .33; difference of 1st and 4th quills, .24; length of bill from forehead, .55, from nostril, .34; along gape, .65; tarsus, .84; middle toe and claw, .75; claw alone, .25; hind toe and claw, .56; claw alone, .27.

In a series of over one hundred specimens of black-faced *Geothlypis*, agreeing in general characters with *G. trichas*, there is one specimen from Mexico so different from all the rest as apparently to be entitled to specific separation. It is of considerably larger size than the average of *G. trichas;* the tail is longer; its feathers broader. The feet are larger; the middle toe and claw much longer. The entire under parts are of a nearly uniform yellow, without the whitish of the abdomen so characteristic of typical *G. trichas*. The space above, and inclosed by the black facial mask, is quite pure bluish-white, of much greater extent than in other specimens.

This species is probably resident in Mexico, as the specimen de-

scribed is in full spring plumage, without any clouding of the black mask. It is very different from *G. speciosa*,[1] Scl.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
26,372	..	♂	Mexico.	...	J. Krider.	.....

(26,372.) Type of species.

Geothlypis velata.

Sylvia velata, VIEILL. Ois. Am. Sept. II, 1807, 22, pl. lxxiv.—D'ORB. Voy. IV, 217.—*Trichas velata*, Sw.; BURM. Uebers. III, 1856, 115. —*Geothlypis vel.* CAB. Mus. Hein. 1850, 16.—SCLATER, Catal. 1861, 27, no. 170.

Sylvia canicapilla, MAX. Beit. III, 701 (Brazil).

Hab. Brazil.

(No. 24,042.) Bill slender, conical, much as in *G. macgillivrayi*, the culmen nearly straight. First quill about equal to the 8th; the 4th longest. Color

Geothlypis speciosa, SCLATER.

Geothlypis speciosa, SCLATER, P. Z. S. 1858, 447 (Mexico).—IB. Catal. 1861, 27, no. 169.

Hab. Eastern Mexico.

"Bright oil yellow; head, especially on the sides, with the auricular region, black; quills blackish-brown; beneath bright yellow, the sides brownish, under wing coverts yellow; bill black; feet dusky flesh color. Length, 5.30; wing, 2.40; tail, 2.30."—*Sclater.*

I have not seen this strongly marked species, which differs from *G. trichas* apparently in the wider black mask, absence of hoary margin to the mask, and in uniform yellow of under parts, including lining of wings. The tarsi, toes, and claws are longer. In these respects, as well as in the coloration of the under parts, it agrees with *G. melanops;* but lacks the white head of the latter, in which, too, the black extends rather less on the forehead than even in *G. trichas.*

Geothlypis semiflavus, Sclater (*G. semiflavus*, Sclater, Pr. Z. 1860, 273, 291. —Ib. Catal. 1861, 27, no. 168, Ecuador), is said to agree with the last mentioned, in most points, but to differ in paler olive above, and purer yellow beneath. The black of the cheeks extends far down on the sides of the neck, and on the forehead reaches to above the eyes. The three black-faced *Geothlypi*, therefore, of the regions south of the United States, agree in the purer and more continuous yellow beneath, and longer toes. An interesting coincidence in this respect is seen with the chestnut-headed *Basileuteri*—*B. rufifrons* and *G. trichas*, the more northern species having the whitish belly; *B. dellatrii* and *G. speciosa*, from the middle region, having this more yellow; while the South American *B. mesochrysus* and *G. semiflavus* have the yellow of greatest intensity.

above olive green; the forehead, loral region, and sides of head extending a little above the eyes and over the ears, black; the rest of the head above ashy, glossed with brown, the color extending over the sides of the occiput to the black of cheeks. Whole under parts, with edge of wings, rich yellow; the lining of wings rather paler; the sides tinged with olive green. Upper mandible black; lower paler, or whitish. Legs apparently flesh color.

Total length, 5.30; wing, 2.35; tail, 2.40; graduation, .36; difference between 1st and 4th quills, .24; length of bill from forehead, .50, from nostril, .35; along gape, .62; greatest depth, .16; tarsus, .86; middle toe and claw, .75; claw alone, .25; hind toe and claw, .55; claw alone, .27.

In the best specimen before me (24,042) there is a line of whitish feathers in the fold of skin bounding the lower eyelid inferiorly, apparently concealed from view in ordinary cases. The feathers on the extreme edge of the eyelid are, however, black, not white as in *G. macgillivrayi*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
15,223	..	..	Brazil. [zil.	...	U. S. Expl. Exped.	T. R. Peale.
24,042	..	..	St. Catherines, Bra-	...	L. Wells.	.....
..	94	..	Bahia.	...	Cab. Lawrence.	.....

(94.) This specimen has the bill rather stouter than the preceding.

Geothlypis æquinoctialis.

Motacilla æquinoctialis, Gm. S. N. I, 1788, 972.—*Trichas æq.* Gray.—*Geothlypis æq.* Cab. Mus. Hein. I, 1850, 16.—Sclater, Catal. 1861, 27, no. 171 (Trinidad; Cayenne).—Taylor, Ibis, 1864, 81 (Trinidad).

Hab. Northeastern portion of South America (Cayenne; Trinidad, etc.).

(No. 2,905.) Bill stout; the culmen and commissure gently curved from the base. First quill about equal to the 9th; 3d and 4th longest. Upper parts olive green; forehead, with loral region and cheeks, including a short space above the eye and ear coverts, black. Top of the head ash gray, with rounded or somewhat pointed outline on the occiput, so that the olive of the nape extends forward to the black cheeks, cutting off the ashy. Under parts yellow, with perhaps a faint tinge of ochry along the belly. Upper mandible dark brown; lower nearly white. Legs apparently flesh color. A line of concealed grayish feathers on the lower eyelid.

Total length, 5.00; wing, 2.50; tail, 2.30; graduation, .46; difference between 1st and 4th quills, .30; length of bill from forehead, .60, from nostril, .36; along gape, .65; depth, .19; tarsus, .90; middle toe and claw, .82; claw alone, .22; hind toe and claw, .66; claw alone, .30.

The differences between the species of gray-crowned *Geothlypis* from Brazil (*velatus*), and its ally (*æquinoctialis*) from northern South America (Cayenne, Guiana, and Venezuela), were first contrasted by Cabanis, and appear to be substantially correct as stated.

The ashy of the crown, in the present species, is more restricted, as instead of passing down the occiput, and extending straight across between the black cheeks, its outline is rounded behind, less extended, and allowing the olive green of the nape to pass forward to the dusky eyelids. The under parts are of a more ochry yellow. The bill above is paler. The bill is considerably stouter at the base, and more curved; the legs, too, decidedly stouter; the middle and hind toe longer. The tail appears to be a little shorter, or at least not longer than the wings, instead of decidedly longer.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,905	..	..	S. Amer.? ("Californ-	...	S. F. Baird.	J. J. Audubon.
2,367	..	..	Trinidad. [nia"??)	...	"	.....
562	..	..	S. America?	...	"	.....

(2,905) Supposed to be type of *Trichas delafieldii*, and also type of *Trichas velata*, BAIRD, Birds N. Am.

Geothlypis poliocephala.

Geothlypis poliocephala, BAIRD, n. s.

? *Geothlypis æquinoctialis*, SCLATER & SALVIN, Ibis 1860, 273 (Guatemala). Not of GM.

Hab. West coast of Mexico, and Central America?

(No. 34,017.) Bill very stout, with the culmen considerably curved from the base, and not unlike *Icteria;* the depth of bill more than half distance from nostrils to tip. Tail considerably longer than the wings, a good deal graduated. Wings short, much rounded; the 1st quill about equal to 9th.

Above olive green. A narrow frontlet of black, extending over loral region to the eye, and curving round, passes a short distance below it. Eyelids white. Top of head and nape, and sides behind the eyes, including most of ear coverts, ashy. Beneath, including bend of wings, dull yellow; the sides paler, and tinged with brown. Inside of wings yellowish-white. Outer primary, as usual in the genus, edged with white, the others with olive. Bill light brownish above, whitish beneath.

This specimen is marked male, but is in poor condition. One received from Mr. Salvin, from Guatemala, differs a little in having the black continued entirely round the eye, but inferiorly not extending behind its posterior extremity. There are no white feathers on the eyelids. The sides of head and ears are ashy, as in the first specimen. The bill is even stouter, and the culmen more curved, than in 34,017, and exhibits a very striking difference from that of *G. velata.*

Length (34,017), 5.40; wing, 2.20; tail, 2.65; its graduation, .50; difference between 1st and 4th quills, .18; bill above, .50, from nostril, .30, from gape, .61; depth, .165; tarsus, .87; middle toe and claw, .68; hind toe and claw, .51.

No. 30,677. Length, 5.35; wing, 2.35; tail, 2.60 (worn); bill above, .56,

15 April, 1865.

from nostril, .35; greatest depth, .185; tarsus, .91; middle toe and claw, .80; hind toe and claw, .60.

The species above described, if its characters are maintained throughout a series of specimens, appears to me worthy of separation from *velata* and *æquinoctialis*, being really more different from them than are the two latter from each other. Whether the two specimens are identical as species remains to be proved; the difference between the white eyelids of the one, with the eye not encircled behind by black, and the narrow black border behind the eye of the other, to the exclusion of the white eyelids, is somewhat analogous to that distinguishing *G. macgillivrayi* from *G. philadelphia*. The former condition may, however, be only a feature of immaturity, as the female and young *G. philadelphia* have whitish eyelids.

The differences from allied species are expressed in the synopsis. The ash of the head is even more extended than in *G. velata*—reaching over the nape and on the sides of head, where it replaces much of the black of the cheeks of the others. The bill is much stouter, the culmen more curved; the tail is longer, and the wings shorter and more rounded. The legs are apparently intermediate in character.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,017	16	♂	Mazatlan.	June 14, '62.	A. J. Grayson.	.....
†30,677	198	..	Petaleulen, Guat.	Sept. 1862.	O. Salvin.	.....

(34,017.) Type of species.

Geothlypis philadelphia.

Sylvia philadelphia, WILS. Am. Orn. II, 1810, 101, pl. xiv; AUD.; NUTT. —*Trichas philadelphia*, JARD.—REINHARDT, Vidensk. Meddel. for 1853, and Ibis, 1861, 6 (Greenland).—*Geothlypis phila.* BAIRD, Birds N. Am. 1858, 243, pl. lxxix, fig. 3.—SCLATER, Catal. 1861, 27 (Orizaba).—LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama).

FIGURES: WILS. Am. Orn. II, pl. xiv.—AUD. B. A. II, pl. 101.

Hab. Eastern province of United States to British America; Greenland; southeastern Mexico and Panama R. R. Not recorded from West Indies or Guatemala.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,819	..	..	Stewiacke, Nova	...	W. G. Winton.	W. G. Winton.
1,499	..	♂	Carlisle, Pa. [Scotia.	May 26, '44.	S. F. Baird.	S. F. Baird.
1,024	..	♀	"	May, 1843.	"	"
27,033	..	♂	Selkirk Settlement.	...	Gov. Mactavish.	.....
27,052	..	♀	"	...	Donald Gunn.	Donald Gunn.
..	..	♀	South Illinois.	...	R. Kennicott.	.....
7,515	45	..	Independence, Mo.	...	Dr. Cooper.	.....
..	207	..	Panama R. R.	...	Cab. Lawrence.	M'Leannan.

Geothlypis macgillivrayi.

Sylvia macgillivrayi, Aud. Orn. Biog. V, 1839, 75, pl. 399.—*Trichas macg.* Aud.—*Geothlypis macg.* Baird, Birds N. Am. 1858, 244, pl. lxxix, fig. 4.—Sclater, Catal. 1861, 27 (Jalapa and Guat.).—Ib. P. Z. S. 1859, 363, 373 (Xalapa, Oaxaca).—Cab. Jour. 1861, 84 (Costa Rica).—Cooper & Suckley, P. R. R. Rep. XII, II, 1859, 177. —*Sylvicola macg.* Max. Cab. Jour. VI, 1858, 118.

Sylvia tolmiæi, Towns. J. A. N. Sc. 1839.—*Trichas tolmiæi*, Nutt. Man. I.

Trichas vegeta (Licht.), Bp. Consp. 1850, 310; *fide* Cab. Jour. 1861, 84 (Mexico).

Hab. Western and middle provinces of United States to northern boundary; south to Costa Rica.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,905	356	..	Ft. Steilacoom, W.T.	May 3, '56.	Dr. Suckley.	Dr. Suckley.
1,910	..	♂	Columbia River.	May, 1835.	S. F. Baird.	J. K. Townsend.
15,945	321	♂	Chiloweyuck Depot	June 20.	A. Campbell.	Dr. Kennerly.
25,373	681	..	Fort Tejon, Cal.	Sept. 1857.	John Xantus.	John Xantus.
10,944	..	♂	Fort Bridger.	June 10.	C. Drexler.	C. Drexler.
10,954	..	..	Fort Laramie.	Aug. 31.	W. M. Magraw.	Dr. Cooper.
32,178	2,486	..	Cape St. Lucas.	Dec. 16, '59.	John Xantus.	John Xantus.
32,466	45	♀	Orizaba, Mex.	...	Prof. Sumichrast.	Prof. Sumichrast.
32,704	40,772	♂	Mexico.	...	Verreaux.	.....
30,675	4,612	♀	Coban, Guat.	Nov. 1859.	O. Salvin.	.....
30,674	201	♂	Dueñas, Guat.	Jan. 31, '58.	"	.....

(1,910.) Type of species. (32,178.) Iris dark brown.

Geothlypis

(No. 30,676.) Among some specimens from Guatemala, presented by Mr. Salvin to the Smithsonian Institution, is one labelled *Geothlypis macgillivrayi;* which, however, by no means belongs to it, and is of a species quite unknown to me. In form it is intermediate between *Geothlypis* and *Oporornis*—having a pointed wing, a little longer than tail; the 3d quill longest, the 2d a little longer than the 4th, the 1st about equal to it. The under tail coverts are as in *Oporornis*, reaching nearly to the end of the tail. The legs are also as in *Oporornis*. The upper parts are olive green, brightest towards the tail; the head above tinged with brown. The whole under parts are yellow, less vivid on the throat, and tinged with ashy across the breast. An obscure line from bill to eye, and the eyelids are yellowish-white; a dusky spot before the eye. Bill horn color. Legs yellow. It resembles the female *G. trichas* in the yellowish throat, but the wings are longer and more pointed, etc. Length, 5.00; wing, 2.40; tail, 2.25; tarsus, .83; middle toe and claw, .67. The wings are much too short for either *O. agilis* or *formosus*, though otherwise similar in form.

This may possibly be the female of *G. speciosa*, Scl., which I have not seen. It is certainly different from any species known to me, in combining characters of the two genera mentioned.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,676	3,154	..	Dueñas, Guat.	Sept. 17, '59.	O. Salvin.	.....

SUBFAMILY ICTERIANÆ.

ICTERIA, VIEILLOT.

Icteria, VIEILLOT, Ois. Am. Sept. I, 1807, iii and 85. (Type *Muscicapa viridis*, GM., *Turdus virens*, LINN.)

Bill broad at base, but contracting rapidly and becoming attenuated when viewed from above; high at the base (higher than broad opposite the nostrils); the culmen and commissure much curved from base; the gonys straight. Upper jaw deeper than the lower; bill without notch, or rictal bristles. Nostrils circular, edged above with membrane, the feathers close to their borders. Wings shorter than tail, considerably rounded; 1st quill rather shorter than the 6th. Tail moderately graduated; the feathers rounded, but narrow. Middle toe without claw about two-thirds the length of tarsus, which has the scutellæ fused externally into one plate.

The precise systematic position of the genus *Icteria* is a matter of much contrariety of opinion among ornithologists; but I have little hesitation in including it among the *Sylvicolidæ*. It has been most frequently assigned to the *Vireonidæ*, but differs essentially in the deeply cleft inner toe (not half-united as in *Vireo*), the partially booted tarsi, the lengthened middle toe, the slightly curved claws, the entire absence of notch or hook in the bill, and the short, rounded wing with only nine primaries. The wing of *Vireo*, when much rounded, has ten primaries—nine being only found when the wing is very long and pointed.

Icteria virens.

Turdus virens, LINN. Syst. Nat. 10th ed. 1758, 171, no. 16 (based on *Œnanthe americana, pectore luteo*, Yellow-breasted Chat, CATESBY, Carol. I, tab. 50).

Muscicapa viridis, GMELIN, Syst. Nat. I, 1788, 936.—*Icteria viridis*, BON.; AUD. Orn. Biog. II, pl. 137.—BAIRD, Birds N. Am. 1858, 248.—? MAX. Cab. Jour. VI, 1858, 122.

Icteria dumicola, VIEILL.—*Pipra polyglotta*, WILS.

?*Icteria velasquezii*, BON. P. Z. S. 1837, 117 (Mexico).—SCLATER & SALV. Ibis, I, 1859, 12 (Guatemala).

Hab. Eastern province of United States; rare north of Pennsylvania. Mexico and Guatemala? Not noted from West Indies.

I am still much perplexed in reference to the distinctness of the Mexican *I. velasquezii* from *I. virens.* All the Chats I have seen from localities south of the United States (four in the Smithsonian collection) agree in having the bill lighter colored, the upper mandible brown with lighter lower edge, the lower nearly whitish. All have the sides and crissum tinged with brown. The size is rather less than in *viridis*, the proportions about the same; the tail if anything shorter, not longer. In two specimens the bill is shorter, higher, and the culmen more curved than in any *virens* I have seen; in one it is about the same, and in another (13,601) it is longer and more slender. The white maxillary patch is rather restricted.

In no adult male specimens from the United States do I find the bill other than intense black, and the crissum pure white. The flanks are a little brownish, but less so than in Mexican skins. A female from Carlisle, Pa., however (2,312; May), has the crissum and flanks precisely as in southern specimens; the bill, also, is nearly as light colored.

I. longicauda has the tail much longer, and the upper parts much grayer. The mandibular white extends farther back, as does the white at the posterior corner of the eye. Young birds from Cape St. Lucas differ from adults in the light-colored bill, and brownish wash on the flanks and crissum; but the back, instead of being pure olive green, has a brownish faded appearance.

Cabanis (Journal, 1860, 403), in summarily uniting all described *Icteria* into one species, entirely overlooks the great difference in the length of the tail of eastern and western specimens.

Icteria auricollis, of Licht., doubtless refers to *I. velasquezii.*

Specimens of this species are in the Smithsonian museum from all parts of the United States east of the valleys of the lower Missouri, as far west as Fort Riley and Neosho Falls, Kansas, and south of Cape May and Carlisle; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
19,080	37	..	Fort Cobb, Ark.	May 27.	J. H. Clark.	C. S. McCarthy.
22,371	43,775	..	Mexico.	...	Verreaux.	.....
7,954	..	..	Guatemala.	...	J. Gould.	.....
13,601	..	..	"	...	"	.....
20,404	..	..	Choctun, Vera Paz.	Jan. 1860.	O. Salvin.	.....

Icteria longicauda.

Icteria longicauda, LAWRENCE, Ann. N. Y. Lyc. VI, April, 1853, 4.—BAIRD, Birds N. Am. 1858, 249, pl. xxxiv, fig. 2.—SCLATER, Catal. 42, no. 253.

?*Icteria auricollis* (LICHT. Mus. Berl.), BON. Consp. 1850, 331.

Hab. Western and middle provinces of United States; Cape St. Lucas and Mexico?

Specimens of this species are in the Smithsonian collection from many points in California and the Rocky Mountains as far north as Yreka, Cal., to northern Mexico, and east to the Upper Missouri, as—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
5,310	..	♀	Ft. Lookcut, Mo. Riv.	June 17, '56.	Lt. Warren.	Dr. Hayden.
4,648	..	♂	Ft. Pierre, "	May 12, '55.	Col. Vaughan.	"
8,841	..	..	Loup Fork.	Aug. 5.	Lt. Warren.	"
16,948	3,236	♂	Cape St. Lucas.	Oct. 10.	J. Xantus.	J. Xantus.
9,109	34,716	..	Mexico.	...	Verreaux.	.....

GRANATELLUS, DUBUS.

Granatellus, DUBUS ("Esq. Orn."), BON. Consp. 1850, 312. (Type *G. venustus*, DUB.)

Bill shaped much as in *Icteria*; broad and high at the base, scarcely notched at tip. Culmen and commissure much curved; gonys slightly convex; the upper edge of lower jaw much curved, but straight towards the end. Lower jaw deeper than the upper. Nostrils circular, in anterior end of nasal groove, with membrane against posterior half, but not above it, and with the nasal feathers falling short of their edges, as in some *Troglodytidæ* and *Donacobius*. Rictal bristles inconspicuous; the throat and chin with bristles interspersed among the feathers. Tarsi short; the scutellæ much fused on the sides. Wings considerably shorter than the rounded tail, the feathers of which have rounded tips; the first quill as short as the secondaries.

I can find no place for this curious form so appropriate as near to *Icteria*, as although the style of coloration is very different (ashy above, sides white, belly red), the structure is much alike. The bills are quite similar in shape and proportions—being very deep, and the upper mandible much decurved from the base; there is, however, a very slight faint notch, scarcely appreciable in some specimens. A striking difference is in the disproportionate size of the lower jaw, which is actually deeper than the upper, anterior to the nostrils. The naked space just behind the nostrils is also peculiar, as perhaps the absence of membrane above them. The tail is more graduated, and the feathers more rounded than in *Icteria*.

Four species of this genus are now known, the differences of which are indicated in the following diagnoses. The characters of *G. sallaei* and *pelzelnii* I borrow from Sclater—not having seen these species.

COMMON CHARACTERS.—Slaty blue above; tail black. A broad post-ocular patch, and sides of body white. Middle region of body beneath, from breast to crissum inclusive, vermilion red.

Sides of head and neck black; chin and throat white.

Top of head like the back; forehead and pectoral collar black; lateral tail feathers tipped with white . . . . *venustus.*

Similar to last, but without black pectoral collar . . . . *franciscæ.*

Top of head black; no black pectoral collar; tail feathers without white tips . . . . . *pelzelnii.*

Sides of head, with entire chin and throat, plumbeous; tail feathers not tipped with white . . . . . *sallaei.*

Granatellus venustus.

Granatellus venustus, "DUBUS, Esq. Orn. tab. xliv," BON. Consp. 1850, 312 (Mus. Bruxell. ex Mexico).—SCLATER, P. Z. S. Nov. 1864, 607, pl xxxvii, fig. 2 (copied from Dubus).

Hab. Western Mexico.

(No. 30,169, ♂.) Above bluish slate color. Forehead, sides of head and neck including edge of vertex, and a narrow pectoral collar, continuous black. A broad triangular patch of white behind the eye in the black of the neck. Median portion of under parts, from the black pectoral band to and including crissum, vermilion red. Axillars, lining of wings, flanks, chin and throat (which are bordered by black, as described) white; side of breast plumbeous. Outer web, and terminal half of inner web of 1st tail feather, terminal fifth of 2d, and a slight tip of 3d, all white; rest of tail black. Quills dark brown, edged externally like the back, internally with whitish. Bill dark plumbeous, paler on the tomia and gonys; legs rather dusky. Iris white.

A close examination shows a number of black bristles interspersed in the white of the throat.

Length, 5.40; wing, 2.47; tail, 2.90; graduation, .35; difference between 1st and 4th quills, .36; bill above, .55; nostril, .36; gape, .65 tarsus, .77; middle toe and claw, .60.

The differences between this species, *G. pelzelnii*,[1] and *G. sallaei*, are given below.

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[1] **Granatellus pelzelnii.**

Granatellus pelzelneii, SCLATER, P. Z. S. Nov. 22, 1864, 606, pl. xxxvii, fig. 1 (Madeira River, Brazil).

Supra plumbeus, pileo et capitis lateribus nigris; vitta post-oculari utrinque

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
30,169	505	♂	Sierra Madre, Colima.	April, 1863.	John Xantus.	Iris white.

Granatellus francescæ.

Granatellus francescæ, BAIRD, n. s.

Above bluish slate color. Forehead, continuous with a broad stripe above and beyond the eye, as also the sides of the head and neck, black. A triangular patch of pure white extending from the postero-superior border of the eye, along the side of the head and continued, though much obscured, across the nape. Under parts, including inside of wings and side of breast, white; the jugulum and median line of body to and including crissum, carmine red. Wings blackish; the outer webs more plumbeous, edged with paler, and with two narrow whitish bars across the coverts; the inner webs abruptly edged with white. Tail black, the outer feather white, except at base; the black passing farther along the inner web; the next feather with the black more extended; the third with the white confined to the tip; the fourth with a narrow streak of white in the end; the others all black. Tibiæ plumbeous. Bill lead color; paler along the tomia and the gonys. Legs blackish.

Female with the red of under parts restricted to a tinge on the crissum; the white replaced by soiled pale buff, as also is the black of the head; middle of belly quite white. Young male like female, but with under parts purer white; the jugulum and under parts with traces of red.

Total length, 6.35; wing, 2.51; tail, 3.40, its graduation, .60; difference of

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lata et corpore subtus albis; pectore toto, ventre medio et crisso rosaceo-rubris; alis et cauda nigricanti-fuscis, immaculatis; rostro plumbeo, tomiis pallescentibus; pedibus corylinis. Long. corp. 4.50; alæ, 2.00; caudæ, 2.00.

This species was collected, by Dr. Natterer, in Brazil, Sept. 1829, and while most similar to *G. venustus*, differs in the want of the black pectoral band and of the white tips to the tail feathers, and in the black of top of head. The white throat separates it from *sallaei*.

Granatellus sallaei.

Granatellus sallaei (*Setophaga sallaei*, "BP. & SCL.," BP. Comptes Rendus, XLII, May, 1856, 957), SCLATER, P. Z. S. July 8, 1856, 292, pl. CXX (Cordova); 1859, 374, ♀ (Oaxaca); 1864, 607.—SCLATER & SALVIN, Ibis, 1860, 397 (Cajabon, Guat.).

Hab. South Mexico to Guatemala.

G. sallaei differs from *venustus* in having the chin and throat plumbeous instead of white. The black sides of the head, forehead, and pectoral collar appear to be represented merely by a darker shade of the ground color. The tail lacks the white tips. The plumbeous ground color, the white post-ocular stripe, and the red of the breast, belly, and crissum, with the white sides, are common to both species.

1st and longest primaries, .50; length of bill from forehead, .60, from nostril, .37; along gape, .61; tarsus, .80; middle toe and claw, .66; claw alone, .20; hind toe and claw, .45; claw alone, .21.

This beautiful and hitherto undescribed species is quite similar to *G. venustus* in appearance, but differs in a much longer, broader, and more rounder tail. The wing is much graduated; the 4th and 5th quills nearly equal; the 3d a little shorter; the 2d about equal to the 7th; the 1st shorter than the secondaries. The principal difference in coloration consists in the absence of the black pectoral collar (although a few concealed spots may be considered as representing it); in the pure white of the sides of the breast, instead of plumbeous; in the narrow whitish bands across the wings; the greater amount of white on the tail, etc. From *pelzelnii* it is distinguished by the plumbeous crown and white tips of the tail feathers.

This bird is one of a number of new species discovered, during the past winter, by Col. Grayson, on one of the Three Marias, a group of Islands off the coast of Mexico, about eighty miles from San Blas; and I cannot more appropriately dedicate it than to Mrs. Grayson, to whose encouragement Col. Grayson owes so much of the persistency and success with which he has prosecuted the study of the ornithology of California and western Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
37,312	67	♂	Three Marias, Mex.	Jan. 1865.	Col. A. J. Grayson.	"Iris brown."
37,313	70	♂ Juv.	"	...	"	.... [Type.
37,314	69	♀	"	...	"	....

TERETRISTIS, CABANIS.

Teretristis, CABANIS, Jour. Orn. III, 1855, 475. (Type *Anabates fernandinæ*, LEMB.)

Bill slender, rather deep and compressed from the base, not quite so long as the head; the outlines of upper mandible considerably decurved, and without notch at tip; the gonys straight. Rictal bristles short and inconspicuous, not reaching the nostrils. Some scattered bristles in the chin. Nostrils rather elongated, without membrane above them anteriorly, the frontal feathers coming up close. Wings shorter than the slightly rounded tail. First quill shorter than outer secondaries; 2d about equal to 7th; 3d and 4th equal and longest. Tail slightly graduated, the feathers acuminate. Inner toe with basal joint cleft rather more than half; tarsi short, but little longer than middle toe and claw; the scutellæ distinct, or else fused on the outside; claws short, considerably curved. Sexes similar. No spots on the tail.

This is another genus the precise position of which is somewhat

uncertain. The bill is much like that of some *Certhiolæ* in shape and curve, though the mouth is deeply cleft, and the tongue comparatively simple (see page 163), as in the Warblers. In the compression, however, and decurvation of the bill, there is a close relationship to *Icteria*, though it is smaller, longer proportionally, and much more slender. The basal joints of the middle toe are rather more united than common in *Sylvicolidæ;* not so much as in *Vireo*. The tarsi are shorter, and the claws more curved than in *Icteria*.

This genus, confined to Cuba, is represented by two known species which agree in having the upper parts olive gray, the crissum whitish, the wings and tail not varied by white. The diagnosis is as follows:—

Head and neck all round yellow (slightly olivaceous above); rest of under parts whitish, tinged with ashy on the sides *fernandinæ*.

Head and neck above like the back; sides of head (sharply defined against the vertex) and whole under parts, except crissum and anal region, bright yellow . . . . *fornsii*.

Teretristis fernandinæ.

Anabates fernandinæ, Lembeye, Aves Cuba, 1850, 66, tab. v, fig. 2 (western Cuba).—Gundlach, Bost. Jour. VI, iii, 1853, 317 (eggs; Cuba).—*Teretristis fern.* Cab. Jour. III, 1855, 475.—Gundlach, Ib. 1861, 326 (Cuba; very common).—*Helmitherus blanda*, Bon. Consp. I, April, 1850, 314, Cuba (not the species of Lichtenstein, *fide* Cabanis).

Hab. Western Cuba.

Head and neck all round olive green above, yellow beneath; the loral region and eyelids, and edge of wings also yellow. Rest of upper parts ashy gray, with faint tinge of olivaceous. Under parts pale ashy gray, lighter across breast; the middle of breast and belly yellowish-white. Lining of wings white. Bill dark lead color, lighter along the tomia. Legs dark brown. The bill varies a good deal in size and shape.

Total length, 5.00; wing, 2.25; tail, 2.45; graduation, .25; difference between 1st and 3d quills, .40; length of bill from forehead, .55, from nostril, .37, along gape, .60; depth, .15; greatest width at angle of rictus, .25; tarsus, .74; middle toe and claw, .62; claw alone, .18; hind toe and claw, .45; claw alone, .22.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,636	..	..	Fermina, Cuba.	Feb. 20.	Chas. Wright.	.....
29,633	..	..	"	April 25.	"	.....
29,635	..	..	"	Feb. 19.	"	.....
29,634	..	..	"	...	"	.....
33,678	..	..	Cuba.	...	Dr. J. Gundlach.	.....
33,677	..	♀	"	...	"	.....
..	134	♂	"	...	Cab. Mr. Lawrence.	.....

Teretristis fornsii.

Teretristis fornsii, GUNDLACH, Ann. N. Y. Lyc. VI, Feb. 1858 (eastern Cuba).—IB. Cab. Jour. 1861, 326 (Cuba; very common).

Hab. Eastern Cuba.

Entire upper parts light ashy. Beneath, including lores, ocular region, and a narrow line above it, ears, and edge of the wing, yellow, sharply defined; the sides of body, anal region to crissum and tibiæ, light dull ash. Inside of wings white. Bill and legs dark plumbeous.

Length, 4.90; wing, 2.25; tail, 2.35; bill from gape, .60; tarsus, .73. No. 23,511 has a much broader bill than usual.

In proportions this species resembles the *fernandinæ*, but the two are easily distinguished by the color. In the former the head above is olive green, the yellow of under parts confined to throat; in *fornsii* the whole upper parts are uniform ashy, the yellow of under part extending over the breast and belly.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,717	..	..	Monte Verde, Cuba.	...	Chas. Wright.	.....
17,718	..	..	"	...	"	.....
23,511	..	..	"	Sept. 4, '61.	"	.....
23,512	..	..	"	...	"	.....
33,076	..	..	Cuba.	...	Dr. J. Gundlach.	.....

SUBFAMILY SETOPHAGINÆ.

Sylvicoline birds with the characters of Flycatchers; the bill notched at tip, depressed and broad at the base, though quite deep; the rictus with well developed bristles reaching beyond the nostrils, sometimes to the end of the bill. First quill rather less than the 4th, or still shorter. Size of the species rarely exceeding six inches. Colors red, yellow, and olive.

The species of this section resemble the small Flycatchers of the family *Tyrannidæ* in the structure of the bill, etc., and in the habit of capturing insects more or less on the wing, though they are more restless in their movements, seeking their prey among trees, or in bushes, rapidly changing their place, instead of occupying a perch, and returning to it, after pursuing an insect through the air. The yellow or orange crown found in many species also carries out the analogy; but the strictly Oscine characters of the tarsal scutellæ, and the nine primaries will serve to distinguish them.

While the *Sylvicoleæ* are eminently characteristic of the ornithology of North America, in the number of specimens and of species—few indigenous true Warblers being found south of the

United States—it is this section that has its highest development in South and Middle America, the species being almost equally numerous with the *Sylvicolinæ*. It is a curious fact, too, that the *Setophagæ* of the United States agree with the *Sylvicolinæ* in the wing being long and pointed, the 1st quill being always longer than the 5th; while the more southern species have the wing more rounded, the 1st quill always considerably shorter than the 5th; and even in the *Dendrœcæ* of the West Indies and South America the 1st quill is much shorter than in very near northern allies (as *D. petechia* and *vieillotii* compared with *æstiva*). The only exception is in *Cardellina rubrifrons* of Mexico which has a pointed wing. What the signification of this more imperfectly developed wing in the southern members of the *Sylvicolidæ* may be, I am at present unable to state, or whether a similar condition exists in other families.

As usual in extensive divisions of birds, the transition from one generic form to another is so gradual, through the different species, that it is very difficult to define the genera with precision, or to establish trenchant characters for separating them. The following synopsis, however, will be found to express the principal modifications of structure and characters of the group:—

A. Wings pointed; the 1st quill longer than the 5th: the 3d as long as or longer than the 4th. Tail nearly even, or slightly rounded (the difference of the feathers less than .3): the feathers broad and firm; the outer webs of exterior feathers narrow at base, but widening to nearly double the width near the end.

1. Bill from gape nearly as long as skull, broad at base and much depressed; rictal bristles reaching half way from nostrils to tip. Culmen and commissure nearly straight. Wings equal to the tail. Tarsi long; toes short; middle toe without claw, about half the tarsus . . . . . *Setophaga.*

2. Bill from gape nearly as long as skull, broad at base, but deep and more Sylvicoline; rictal bristles reaching but little beyond nostrils. Culmen and commissure straight to the tip. Wings longer than the almost even tail. Middle toe without claw, three-fifths the tarsus . . . . . *Myiodioctes.*

3. Bill from gape much shorter than head, wide at base but compressed and high; the culmen and commissure much curved from base, scarcely notched at tip; rictal bristles reaching nearly half way from nostrils to tip. Wings about equal to the almost even tail. Middle toe without claw, about three-fifths the rather short tarsus . . . . . *Cardellina.*

B. Wings rounded; the 1st quill shorter than in the preceding section, always less than the 5th.

1. Bill much depressed, and widened at base. Culmen and commissure quite straight to near the tip.

a. Bill attenuated towards the end; lateral outlines straight or concave. Tail decidedly longer than the wings. Second quill as long as 6th.

Rictal bristles reaching nearly to tip of bill, which from gape is rather less than the length of skull. Tail considerably graduated (.50), the feathers soft, broad; the outer web of outer feather wide, nearly even, and about one-third the width of inner. A rufous patch on vertex . . . . . *Myioborus.*

Rictal bristles reaching a little beyond middle of bill, which is elongated, and from gape about equal to length of skull. Tail moderately rounded, the feathers firm; the outer web of outer feather not more than one-fourth the width of inner. A yellow stripe on vertex . *Euthlypis.*

b. Bill broad towards the end; lateral outlines obtuse, like *Todirostrum*. Tail very little longer than the wings. Second quill much shorter than 6th.

Rictal bristles extending just beyond nostrils. Tail graduated, the feathers narrow, pointed. Outer webs narrow . *Myiothlypis.*

2. Bill pointed, depressed, and more or less wide at base, but deep, and the culmen gently curved from the base.

a. Tail nearly even, the feathers narrow, about equal to or very little longer than the lengthened wings (1st quill about equal to the 7th). Bill thickened, and broad at base. Rictal bristles lengthened. Tarsi short. Vertex with two black stripes inclosing a median one of a yellow, orange, or ashy color . . . . *Basileuterus.*

b. Tail decidedly longer than the abbreviated wings (1st quill not longer than 9th), much graduated, the feathers narrow. Bill rather narrow, scantily bristled. Tarsi long. Top of the head chestnut . . . . . *Idiotes.*

c. Tail about equal to the lengthened wings (1st quill about equal to the 6th), nearly even, the feathers broad. Bill very small, and narrow; rictus well bristled; prevailing color red. . *Ergaticus.*

The preceding synopsis is strictly empirical, and intended merely to aid in distinguishing the genera. A more natural order of sequence is to arrange the genera into three groups, of which *Setophaga*, *Myiodioctes*, and *Cardellina* respectively may be considered as types, with several divergent forms, representing each other in the following order:—

Tail broad, rounded, a little or considerably longer than the wings. Bill broad and flat:—

SETOPHAGA. *Setophaga*,
Euthlypis,
Myioborus.

Tail narrow, nearly even, and about equal to the wings. Bill broad, depressed:—

MYIODIOCTES. *Myiodioctes*,
Basileuterus,
Idiotes,
Myiothlypis.

Tail as in preceding. Bill narrow, Parine in appearance. Culmen curved:—

CARDELLINA. *Cardellina*,
Ergaticus.

In these three divisions, typical *Setophaga*, *Myiodioctes*, and *Cardellina*, respectively, have the wing long and sharp-pointed; the others succeeding these have the wing shorter, more rounded, and exhibit other divergent characters. I am by no means disinclined to restrict the genera of *Setophageæ* to the above mentioned three, or at least to four, including *Basileuterus*, and to consider the others as only sections or subgenera. There scarcely appears to be any alternative to this view than to accept all the others mentioned as of independent generic rank.

MYIODIOCTES, AUDUBON.

Myiodioctes, AUDUBON, Synopsis, 1839, 48. (Type *Motacilla mitrata*, GM.)—BAIRD, Birds N. Am. 1858, 291.
Wilsonia, BONAP. List, 1838 (preoccupied in botany).
Myioctonus, CABANIS, Mus. Hein. 1850, 18. (Type *Motacilla mitrata*.)

Bill broad, depressed; the lateral outlines a little concave; the bristles reaching not quite half way from nostrils to tip. Culmen and commissure nearly straight to near the tip. Nostrils oval, with membrane above. Wings pointed, rather longer than the nearly even but slightly rounded tail; 1st quill shorter than the 4th, much longer than 5th; the 2d and 3d quills longest. Tarsi rather lengthened, the scutellar divisions rather indistinct; the middle toe without claw, about three-fifths the tarsus.

This genus differs from typical *Setophaga* in stouter feet and much longer toes—the middle toe of *S. ruticilla* not exceeding the lateral of *M. mitratus*. The tail is shorter than the wings, not longer than or at least equal to them. The bill is differently shaped, being narrower and more cylindrical, though decidedly depressed; the lateral outlines are slightly concave, not about straight. The tip is less decurved.

M. pusilla and *canadensis* are quite similar, generically with rather more tumid bill, and perhaps narrower tail feathers.

The species of *Myiodioctes* all belong to the United States, and I have already given a synopsis of their characters in Birds N. Am.

Myiodioctes mitratus.

Motacilla mitrata, GMELIN, S. N. I, 1788, 293.—*Sylvia m.* LATH.—VIEIL. II, pl. 77.—BON.; NUTT.; AUD. Orn. Biog. II, pl. 110.—*Sylvicola m.* MAX. Cab. Jour. VI, 1858, 113.—*Sylvania m.* NUTTALL, Man. I, 1840, 333.—*Setophaga m.* JARD.—D'ORB. Sagra's Cuba Ois. 1840, 89.—*Wilsonia m.* BON. 1838.—ALLEN, Pr. Essex Inst. 1864.—*Myiodioctes m.* AUD. Syn. 1839, 48.—IB. B. A. II. pl. 71.—SCLATER, P. Z. S. 1856, 291 (Cordova); 1858, 358 (Honduras).—IB. Catal. 1861, 33, no. 202.—BAIRD, Birds N. Am. 1858. 292.—JONES, Nat. Bermuda, 1859, 26 (March).—SCLATER & SALVIN, Ibis, 1859, 11 (Guatemala).—LAWRENCE, Ann. N. Y. Lyc. VIII, 63 (Panama R. R.).—GUNDLACH, Cab. Jour. 1861, 326 (Cuba).—*Myioctonus m.* CAB. Mus. Hein. 1851.—IB. Jour. Orn. III, 1855, 472 (Cuba).

Muscicapa cucullata, WILSON, III, pl. xxvi, fig. 3.

Muscicapa selbyi, AUD. Orn. Biog. I, pl. 9.

Hab. Eastern Province of United States, rather southern; Bermuda; Cuba; Jamaica; eastern Mexico; Honduras and Guatemala to Panama R. R.

Specimens from various points in the Atlantic and Mississippi Valley States as far north as Carlisle, Pa., and Cleveland, Ohio; also—

Smithsonian No	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,185	..	♀	Jamaica.	...	J. B. Smith.	.....
30,696	..	♂	Choctum, Vera Paz.	1861.	O. Salvin.	.....

Myiodioctes canadensis.

Muscicapa canadensis, LINN. S. N. I, 1766, 327. (*Muscicapa canadensis cinerea*, BRISSON, II, 406, tab. 39, fig. 4)—GMELIN.—WILSON, III, pl. xxvi, fig. 2.—AUD. Orn. Biog. II, pl. 103.—*Setophaga can.* SWAINS.; RICH.; GRAY.—*Myiodioctes can.* AUD. B. A. II, pl. 103.—BREWER,

Pr. Bost. Soc. VI, 5 (nest and eggs).—Sclater, P. Z. S. 1854, 111 (Ecuador; winter); 1855, 143 (Bogota); 1858, 451 (Ecuador).—Ib. Catal. 1861, 34, no. 204.—Sclater & Salvin, Ibis, 1859, 11 (Guatemala).—Lawrence, Ann. N. Y. Lyc. VI, 1862.—Baird, Birds N. Am. 1858, 294.—*Eublepis* con. Cab. Mus. Heine. 1859-51, 15: Jour. Orn. 1860, 326 (Costa Rica).

Sylvia pardalina, Bon.; Nutt.—*Sylvicola pardalina*, Bon.—*Myiodioctes pardalina*, Bon.

?*Muscicapa bonapartii*, Aud. Orn. Biog. I, 1831, 27, pl. 5.—*Setophaga bon.* Rich.—*Wilsonia bon.* Bon.—*Sylvania bon.* Nutt.—?*Myiodioctes bon.* Aud. Syn.—Ib. B. A. II, 1841, 17, pl. 17.—Baird, Birds, N. Am. 1858, 295.

Setophaga nigricincta, Lafr. Rev. Zool. 1843, 292; 1844, 79.

Hab. Whole eastern province of United States; eastern Mexico to Guatemala, and south to Bogota. Not noted from West Indies.

Specimens from eastern United States and Mississippi Valley; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,790	..	..	Ottawa, Can.	...	W. T. Coleman.	.....
13,666	31	..	Isle Caroline, Lake	June 2.	R. Kennicott.	.....
32,715	29,179	♀	Mexico. [Winnipeg?	...	Verreaux	.....
34,091	294	♂	Petaleuleu, Guat.	Sept. 1862.	O. Salvin.	.....
33,254	134	♀	San Jose, C. R.	...	Dr. v. Frantzius.	.....
34,921	..	..	Bogota.	...	J. H. Roome.	.....

Myiodioctes pusillus.

Muscicapa pusilla, Wilson, Am. Orn. III, 1811, 103, pl. xxvi, fig. 4.—*Wilsonia pus.* Bon.—*Sylvania pus.* Nutt.—*Myiodioctes pus.* Bon. Consp. 1850, 315.—Sclater, P. Z. S. 1856, 291 (Cordova); 1858, 299 (Oaxaca Mts.; Dec.); 1859, 363 (Xalapa); 373.—Ib. Catal. 1861, 34, no. 203.—Baird, Birds N. Am. 1858, 293.—Sclater & Salvin, Ibis, 1859, 11 (Guatemala).—Lord, Pr. R. Art. Inst. Woolwich, IV, 1864, 115 (Br. Columbia).—*Myioctonus pus.* Cab. M. H. 1851, 18.—Ib. Jour. 1860, 325 (Costa Rica).

Sylvia wilsonii, Bon.; Nutt.—*Muscicapa wilsonii*, Aud. Orn. Biog. II, pl. 124.—*Setophaga wilsonii*, Jard.—*Myiodioctes wilsonii*, Aud. B. A. II, pl. 75.

Sylvia petasodes, Licht. Preis-Verz. 1830.

Motacilla pileolata, Pall. Zoog. Rosso.-Asiat. I, 1831, 497 (Russian Am.).

Hab. Entire breadth of United States, north to Russian America; Mexico, to Costa Rica.

Specimens from the Pacific coast are more brightly colored than eastern, and the yellow of the forehead has a mixture of orange in it. The size is rather smaller, and the bill seems rather narrower.

There are, however, so many intermediate grades between the two extremes as to render inexpedient any attempt at specific separation.

Specimens in the collection from many localities throughout the United States from Atlantic to Pacific; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,635	474	..	Ft. George, H. B.	Sept. 3, '60.	C. Drexler.	C. Drexler.
20,636	490	..	"	May 26, '60.	"	.....
22,303	..	..	Halifax, N. S.	...	W. G. Winton.	W. G. Winton.
27,291	7	..	Ft. Youkon.	...	J. Lockhart.	J. Lockhart.
27,292	1,229	..	"	May, 1861.	R. Kennicott.	R. Kennicott.
27,290	1,208	..	La Pierre's House.	...	R. R. Ross.	J. Flett.
32,173	2,489	♂	Escondida, C. S. L.	Nov. 1859.	J. Xantus.	J. Xantus.
32,174	6,016	♂	San Gertrude Mts.	Jan. 1861.	"	"
30,138	506	♀	Colima (Sierra Ma-	April, 1863.	"	"
32,467	47	♂	Orizaba, Mex. [dre).	...	Prof. Sumichrast.	Prof. Sumichrast.
30,877	96	..	Mirador, Mex.	Nov. 1862.	Dr. Sartorius.	Dr. Sartorius.
32,716	32,622	♂	Coban, Guat.	...	Verreaux.	.....
30,697	299	..	Dueñas, Guat.	...	O. Salvin.	.....
33,423	129	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
34,655	..	♂	Barranca, C. R.	April 16, '64.	J. Carmiol.	.....
34,656	..	♂	"	April 15.	"	.....
34,657	..	♀	"	April 19.	"	.....

Myiodioctes minutus.

Muscicapa minuta, WILSON, Am. Orn. VI, 1812, 62, pl. 1, fig. 5.—AUD. Orn. Biog. V, pl. 434, fig. 3.—IB. B. A. I, pl. 67.—*Sylvia minuta*, BON.—*Wilsonia m.* BON. List, 1838.

Sylvania pumilia, NUTT. Man. I, 1840, 334.

Hab. Eastern United States.

This species continues to be unknown to modern ornithologists—no specimens being recorded as extant in collections.

BASILEUTERUS, CABANIS.

BASILEUTERUS, Cab.

Basileuterus, CAB. Schomburgk's Reise Br. Guiana, III, 1848, 666. (Type *Sylvia vermivora*, VIEILLOT.) (See *antea*, page 237.)

Bill broad at the base and much depressed, but thick; the culmen curved gently from the base, the commissure curved for most of its extent. Rictal bristles variable, but reaching about half way from the nostrils to tip of bill. The tail is slightly emarginated, and only a little rounded, the lateral feather sometimes rather graduated, the feathers rather narrow. Wing about equal to the tail, rounded; 4th quill longest, 1st about equal to the 8th. Toes rather shorter than in *Myiodioctes*, the middle without its claw nearly two-thirds the tarsus.

There is a good deal of variation in the size of bill and other features, with different species; but the broad decurved bill, nearly even narrow tail with the lateral feather more or less graduated, wings equal to the tail and much rounded, the 1st quill equal to the 8th

and 9th, are common to all. The relationship to *Myiodioctes* is quite close, especially to *canadensis* and *pusillus;* but the characters just mentioned will distinguish them. The transition, however, to *Idiotes* is very gradual, through such species as *I. mesochrysus*. *Setophaga* is distinguished by a much more depressed and thinner bill, with the culmen and commissure nearly straight for most of the length, as well as by other features.

Synopsis of Species of Basileuterus.

Top of head with two black stripes inclosing a median of yellow or orange. No rufous on sides of head.

Beneath entirely yellow.

Central stripe of head orange brown, mixed with gray. Back olive green.

Supra-ocular stripe and eyelids whitish — *vermivorus*,[1] Cab

Supra-ocular stripe and eyelids yellow (not seen) . . . . . — *bivittatus*, Scl.

Central stripe of head yellow, sometimes mixed with orange. Back olivaceous-ash.

Supra-ocular stripe and eyelids yellowish-green . . . . . — *culicivorus*, Bp.

Chin and throat gray; rest of under parts yellow. Back olive. Supra-ocular stripe ash color?

Central stripe of head brownish-orange . . — *coronatus*,[2] Scl.

Central stripe of head yellow; throat darker ash (not seen) . . . . . — *cinereicollis*, Scl.

Top of head with two black stripes inclosing a median of ash, or nearly unicolor ashy or brown. No rufous on sides of head. Beneath whitish, or not bright yellow.

Back olive green, uniform with rump.

Top and sides of head ash, scarcely lighter in centre. Supra-ocular line and eyelids white. Sides tinged with olive green . . . — *leucoblepharum*,[3] [Scl.

[1] A species—*B. hypoleucus*, Bp.—from Brazil, is said to differ in being white beneath.

[2] *B. viridicata*, Burm. III, 113 (D'Orb. Voyage, IX, 325) appears quite similar, with the vertex stripe yellow, not orange. In this respect it agrees with *cinereicollis* (Sclater, P. Z. S. 1864, 166, Bogota), and like it has a grayish-ashy throat, tinged with greenish. The difference I am unable to state. *Basileuterus chrysogaster*, of Peru (*Setophaga chrys.* Tschudi, F. P. 192), is said to be yellow beneath, olive green above, a little darker on top of head where the feathers are yellow at base, and orange in middle.

[3] *Basileuterus leucoblepharum*, Scl. Catal. p. 36. A Paraguayan, and consequently a typical specimen, has the whole top of head uniform slaty gray,

Top of head dusky, inclosing a lighter median ashy stripe. Eyelids and supra-ocular stripe less distinct. Sides tinged with olive green	*superciliosus*, Bd.
Similar to last, but creamy white beneath. Supra-ocular stripe distinct. Sides tinged with rufous or fulvous	*stragulatus*, Scl.
Back dark brownish; rump and base of tail yellowish	*semicervinus*,[1] Scl. *uropygialis*, Scl.

The following are the better known species of *Basileuterus* from South America:—

Basileuterus vermivorus.

Sylvia vermivora, Vieill. Nouv. Dict. II, 1817, 278.—*Basileuterus v.* Cab. Schomb. Guiana.—Sclater, Catal. 1861, 34, no. 34.

Setophaga auricapilla, Swains. Anim. Men. 1838, 293 (Brazil).

Hab. Bogota, Trinidad, Brazil, etc.

Basileuterus hypoleucus.

Basileuterus hypoleucus, Bp. Consp. 1850, 313.—Burm. Uebers. III, 1856, 113 (Brazil).

Basileuterus bivittatus.[2]

Muscicapa bivittata, Laf. & D'Orb. Syn. Av. 1837, 51.—D'Orb. Voyage,

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almost inappreciably lighter along the middle of the crown, the white on the eyelids very distinct. The bill is slender and narrow. Brazilian specimens exhibit a quite well defined band on each side of the crown from the bill, bordering a central stripe of slate gray; the white of eyelids is less prominent, and the bill decidedly broader. These differences, if constant, may render it desirable to establish the *Trichas superciliosus*, of Swainson, as a distinct species, under the name of *Basileuterus superciliosus*.

[1] Not having seen a specimen of *B. semicervinus*, I am unable to give its diagnosis. Sclater says that *B. uropygialis* differs in having the uropygium and rump more lightly colored; the back olive, and head cinereous (instead of brown), almost as in *stragulatus*, with which, too, it agrees in color of lower surface.

[2] A specimen in the collection of the Philadelphia Academy I am unable to refer to any of the described *Basileuteri*. There is a central line on top of head of pale yellowish-gray, the feathers dull yellowish at the base; on each side of this a broad black stripe (wider than in *vermivorus*), the two meeting on the forehead. A dirty whitish line passes from bill over eye to nape, and below this is another well defined line of blackish-ash, through and behind the eye, beginning as a dusky loral spot. There appears to be a whitish patch on the lower eyelid. The under parts, instead of being bright uniform yellow, are olivaceous white along the median line, clouded with purer olive on throat and breast; the sides of belly and body deep olive, like the back.

This may be *B. hypoleucus*, Bon. Consp. 313 (Brazil); but it is not smaller than *vermivorus*, nor can the under parts be called white.

Ois. 324 (Chiquitos, Bolivia). — *Basileuterus bivittatus*, SCLATER, P. Z. S. 1859, 137.—IB. Catal. 1861, 34, no. 206 (Ecuador).

?*Myiodioctes tristriatus*, TSCHUDI, Wiegm. Arch. 1844, 1.—IB. Fauna Peruana, 193 (Peru).

Basileuterus coronatus.

Myiodioctes coronata, TSCH. Wiegm. Arch. 1844 (23), Peru.—*Basileuterus cor.* BP. Consp. 1850, 314.—SCLATER, Catal. 1861, 34, no. 207.

Hab. Ecuador; Bogota.

Basileuterus viridicatus.

Muscicapa viridicata (VIEILL.), D'ORB. Voy. 325.—*Basileuterus viria.* BURM. Uebers. IV, 1856, 113.

Muscicapa elegans, D'ORB. & LAF. Syn. Av. 1837, 52.

Hab. Chiquitos, Bolivia.

This hardly appears to be the bird of Vieillot and Azara; if not, the name of *elegans* may be used.

Basileuterus cinereicollis.

Basileuterus cinereicollis, SCLATER, P. Z. S. 1864, 166 (N. Grenada).

Appears very near *Basileuterus viridicatus* (*elegans*), D'ORB. & LAF.

Basileuterus chrysogaster.

Setophaga chrysogaster, TSCH. Wiegm. Arch. 1844, 16 (Peru).—*Basileuterus chr.* SCLATER.—IB. Catal. 1861, 35, no. 209 (Ecuador).

Basileuterus leucoblepharum.

Sylvia leucoblephara, VIEILL. Nouv. Dict. XI, 1817, 206 (from Azara, Paraguay).—D'ORB. Voy. Ois. tab. 12, fig. 2.—*Trichas leuc.* BURM. Uebers. III, 1856, 114 (Brazil).—*Basileuterus leuc.* SCLATER, Catal. 1861, 36, no. 217.

South Brazil and Paraguay.

Basileuterus superciliosus.

Trichas superciliosus, SWAIN. An. Men. 1838, 295.

North Brazil.

Basileuterus stragulatus.

Muscicapa stragulata, LICHT. Verz. 1823, 55.—*Basileuterus stragulatus*, SCLATER, Catal. 1861, 35, no. 216 (Brazil).

Basileuterus semicervinus.

Basileuterus semicervinus, SCLATER, P. Z. S. 1860, 84.—IB. Catal. 1861, 35, no. 215 (Ecuador).

Basileuterus culicivorus.

Sylvia culicivora, LICHT. Preis-Verzeich. 1830, no. 78 (Mexico; Deppe & Schiede).—CAB. Jour. 1863, 57.—*Basileuterus culicivorus*, BONAP. Consp. 1850, 313.—CAB. Mus. Hein. 1850, 17.

Muscicapa brasieri, GIRAUD, Birds Texas, 1841, pl. vi, fig. 2.—*Basileuterus braseri*, SCLATER, P. Z. S. 1855, 66; 1856, 292 (Cordova); 1859, 374 (Oaxaca).—IB. Catal. 1861, 34, no. 208.—SCLATER & SALVIN, Ibis, II, 1860, 274 (Volcan, Guatemala).

Hab. S. Mexico (both sides); Guatemala and Costa Rica.

(No. 30,698.) Above greenish-ash, more tinged with olive on the upper part of back and rump. Beneath yellow, the crissum somewhat tinged with rufous. Top of head with a black stripe on each side from the bill, the intermediate portion greenish-yellow, passing more into green on the nape, similar in color to a supra-ocular stripe Loral region and space below eye greenish, mixed with yellow. Spot anterior to eye, and a stripe behind it, dusky; all these markings on the side of head, however, obscure, and poorly defined.

Specimens from Mexico and Guatemala, the former marked male, have the median stripe of the head yellow. Others again, likewise from Guatemala and Mexico, have the yellow of each feather passing towards the end more into brownish-orange, apparently unaccompanied by any other differences.

Length (of 30,698), 4.90; wing, 2.40; tail, 2.25; graduation, .16; bill from forehead, .50, nostril, .30, gape, .56; tarsus, .76; middle toe and claw, .56.

This species differs from *Basileuterus vermivorus* and *bivittatus*, of South America, in having the upper parts ashy instead of olive green. The markings of the head are more as in *bivittatus*, as compared with *vermivorus*. The supra-ocular stripe and other lighter markings on the side of the head are greenish, and not ashy or grayish in their tinge. The eyelids are yellow, not white. There is much more yellow in the central stripe on top of heads even mixed with orange, and the feathers are not tinged with gray at the tips. The inside of the wing is greenish-yellow, not nearly white as in *vermivorus;* nor is there the decided indication of whitish in the chin.

B. bivittatus, Laf., from Bolivia and Ecuador, as above stated, differs in the olive back, in this agreeing with *vermivorus*. It agrees more with *culicivorus*, and differs from *vermivorus*, judging from the description, in larger size, and in the yellowish superciliary stripe and circumocular region, instead of grayish-white.

NOTE.—Since writing the preceding description, specimens have been received from Mr. Carmiol, collected in Costa Rica, which differ slightly in having a decidedly olivaceous gloss to the upper plumage, especially on the rump and edge of the quills. I do not note any other differences, and these may be merely seasonal. There is, however, in this respect, a greater approximation to the *B. bivit-*

tatus of authors, and it may ultimately be decided that they belong to that species. All have a slight stain of orange in the end of the yellow feathers of the crown, not quite so decided as in 26,377.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,365	43 907	♂	Mexico.	...	Verreaux.	.....
26,377	..	..	"	...	J. Krider.	D'Oca.
30,698	303	..	Choctun, Vera Paz.	Jan. 1860.	O. Salvin.	Salvin & Godman.
..	120	♂	Guatemala.	...	Cab. Lawrence.	.....
34,651	..	♂	Barranca, C. R.	Mar. 17, '64.	J. Carmiol.	.....
34,652	..	♂	"	"	"	.....
34,653	..	♀	"	March 21.	"	.....

(22,365.) Crown yellow. (22,377.) Crown orange. (30,698.) Crown yellow. (120.) Crown orange. (34,651.) 5; 6½. Crown stained with orange.

Basileuterus uropygialis.

Basileuterus uropygialis, SCLATER, P. Z. S. 1861, 128; 1864, 167.—IB. Catal. 1861, 35, no. 214.

Basileuterus semicervinus, LAWRENCE, Ann. N. Y. Lyc. 1861, 322, Panama R. R. (not of SCLATER, 1860).

Hab. Isthmus of Panama.

(No. 124, Cab. G. N. L.) Upper parts brownish-olive, the head above slightly tinged with cinereous; rump, upper tail coverts, and rather more than basal half of tail, with the under parts, yellowish-fulvous, the latter, however, paler, and quite light on middle of belly, but darker on the crissum. The sides of head, neck and body, inside of wings and breast, washed with olive brown. A line from bill to eye, and eyelids fulvous; lores, and spot behind eye dusky. Terminal half of tail brownish-olive, becoming darker to tip. Bill black. Legs flesh color. First quill equal to the 8th; the wings longer than the tail, which is rounded.

Total length, 4.70; wing, 2.30; tail, 2.10; graduation, .30; difference between 1st and 4th quills, .28; length of bill from forehead, .62, from nostril, .36; along gape, .55; tarsus, .87; middle toe and claw, .66.

This species was identified by Mr. Lawrence as *semicervinus* (from Ecuador) before Sclater's description of *uropygialis* (from Brazil) appeared. It seems, however, to me to agree better with the description of the latter species. According to Sclater, the difference of *uropygialis* from *semicervinus* consists in having the uropygium and under parts lighter, the back olive, and the head cinereous, almost as in *B. stragulatus*, with which also it agrees in coloration of lower surface.[1]

The species is related to *B. stragulatus*, although the bill is broader

[1] Since writing the above, Dr. Sclater, P. Z. S. 1864, 167, states that *B. uropygialis* was erroneously assigned to Brazil, and that its true *patria* is Panama.

at base and the tail shorter, so that the outstretched legs reach to or beyond the tip. The wings are more pointed. The colors beneath are quite similar, not so pale along the median line; the upper parts, however, much darker, the head lacks the blackish, and the fulvous of rump and basal half of tail are wanting in *stragulatus*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,096	..	♂	Panama R. R.	...	G. N. Lawrence.	Galbraith.
..	124	..	"	...	Cab. Mr. Lawrence.	"

IDIOTES, Baird.

Idiotes, BAIRD. (See page 237.) (Type *Setophaga rufifrons*, Sw.)

Bill broad at base, but quite deep, being nearly as high as wide; the culmen curved gently from the base, the lateral outlines straight; the bristles only moderate, reaching half way from nostrils to tip of bill. Tail lengthened, longer than the short wings, and considerably graduated; the 4th quill longest; the 1st not longer than the 9th. Toes rather lengthened.

The species of this group have generally been placed in *Basileuterus*. They, however, differ in having the bill narrower at base, and proportionally deeper, the bristles less developed, although the culmen is as much curved. The wings are much shorter, and the tail proportionally longer and more rounded, considerably exceeding the tail instead of being about equal to it. The transition, however, is quite gradual through *B. belli* and *I. mesochrysus*, which, to some extent, combines the characters of both.

Synopsis of Species of Idiotes.

Back olive; top of head chestnut (bordered with dusky in *belli*).

Cheeks black.

A white superciliary stripe. Beneath whitish . *melanogenys.*

Cheeks chestnut; lores dusky. A superciliary stripe, and another beneath eye, white. Throat and breast yellow.

Rest of under parts white, or only washed with yellowish . . . . . *rufifrons.*

Entire under parts yellow; crissum more fulvous. White infra-ocular stripe reaching behind ears. Chestnut of crown reaching the nape. Wings equal to lateral tail feather . . . . *delattrii.*

Under parts and crissum yellow. Infra-ocular white not extending beyond eye. Chestnut of crown

scarcely extending over occiput. Wing nearly as long as middle tail feather . . . . . *mesochrysus.*

Cheeks, ocular region, and lores chestnut. A superciliary stripe bright yellow, bordered above by dusky.

Whole under parts yellow . . . . . *belli.*

Basileuterus melanogenys.

Basileuterus melanogenys, BAIRD, n. s.

Hab. High-lands of Costa Rica.

(No. 30,497.) Above ashy olive, the quills and tail feathers edged with brighter, edges of the latter slightly tinged with rufous. A square patch of chestnut brown on top of head. The sides of head black, encircling the eyes, each feather white in the centre. A broad stripe of white from base of bill passing over the eye, and margined above by black, which thus borders the rufous crown externally. The forehead mixed black and white. Beneath dull whitish, the sides and to some extent the breast, tinged with olivaceous ash; the chin dusky on account of the blackish tips of the feathers.

The white feathers about the head have all a tendency to black tips and edges, producing the black markings—very few feathers being entirely black.

The wings are a little shorter than the tail. The bill is more slender, and the culmen less decurved than in most species of its section.

Total length, 5.50; wing, 2.50; tail, 2.65; graduation of tail, .35; difference between 1st and 4th quills, .40; length of bill from forehead, .50, from nostril, .30; along gape, .58; tarsus, .85.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,497	117	..	Costa Rica (San	...	Dr. v. Frantzius.	.....
30,498	118	Juv.	" [Jose?).	...	"	.....

(30,497.) Type of species.

Basileuterus rufifrons.

Setophaga rufifrons, SWAINSON, Animals in Menageries, 1838, 294.—BON. Conspectus, 314.—*Basileuterus rufifrons*, BON. Consp. 1850, 314.—SCLATER, P. Z. S. 1856, 291 (Cordova); 1858, 299 (Oaxaca).—IB. Catal. 1861, 35, no. 210.—BAIRD, Birds N. Am. 1858, 296.

Hab. Mexico; northwest to Mazatlan.

Whole top of the head with the ears reddish or chestnut brown; nape and sides of neck ashy. Rest of upper parts olive green, with an ashy tinge of greater or less intensity. A white stripe from each side of the bill (meeting narrowly on the forehead) over the eye, and another pair from lower jaw meeting on the chin and passing beneath the eye, meets its supra-ocular fellow behind the ears, their junctions, however, concealed by the chestnut ear coverts. Lores, and a short space behind the eye dusky. Throat and breast

bright yellow, abruptly defined against the whitish of under parts. Inside and edge of wings yellow; flanks and crissum pale brownish-fulvous; tibiæ more ashy. No spots or bands on wings or tail. The feathers along the middle of forehead and vertex with concealed yellow at the base.

Length, 4.80; wing, 2.00; difference between 1st and 4th (longest) quills, .24; tail, 2.40; its graduation, .55; bill from gape, .55; tarsus, .80.

This species is sometimes described as quite cinereous above; this, however, depends on the state of plumage—perfect specimens being nearly as olivaceous as in *delattrii*. Occasionally specimens are found in which the line of demarcation behind of the yellow breast is obscured by the color passing backwards over the belly in a light wash pervading the whole under parts, the edges of the feathers brighter yellow, leaving the anal region, however, nearly white. The flanks, crissum, and tibiæ are then tinged with greenish olive.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,624	..	..	Mexico.	...	J. Gould.	.....
30,676	132	..	Mirador, Mex.	Oct. 1862.	Dr. C. Sartorius.	.....
28,026	82	..	"	...	"	.....
28,027	7	..	"	...	"	.....
26,375	..	..	Xalapa.	...	J. Krider.	D'Oca.
26,376	..	..	Mexico. [Madre).	...	"	.....
34,018	..	..	Mazatlan (Sierra	Dec. 1861.	A. J. Grayson.	.....

(30,876.) Iris reddish-brown.

Basileuterus delattrii.

Basileuterus delattrii, Bon. Comptes Rendus, XXXVIII, 1854, 383.—Ib. Notes Orn. 1854, 63 (Nicaragua).—Sclater, P. Z. S. 1860, 250 (Orizaba).—Ib. Catal. Am. Birds, 1861, 35, no. 211.—Sclater & Salvin, Ibis, II, 1860, 274, Dueñas (Guatemala), May 8.

Hab. Mexico and Guatemala?

(No. 30,700.) Similar to *rufifrons* in color of head, the olive green of the back brighter, this color invading and replacing the ashy of the nape and sides of neck; the infra-ocular white band, less distinct behind, but apparently extending behind the eyes. Whole under parts greenish-yellow, a little paler on middle of belly; flanks olive green; the sides behind and crissum tinged with fulvous. Wings much rounded, about equal to the lateral tail feather; 1st quill shorter, or not longer than the secondaries, as is the case in *rufifrons*.

Total length, 5.10; wing, 2.10; tail, 2.70; graduation, .52; difference between 1st and 4th quills (longest), .28; length of bill from nostril, .31; along gape, .60; tarsus, .82.

Since receiving an authentic specimen from Mr. Salvin I have found that several specimens from Mexico, formerly considered to

be *delattrii*, are only varieties of *rufifrons;* and I am now unacquainted with any Mexican examples of the species, although quoted by Dr. Sclater as from Orizaba.

Smithsonian No.	Collector's No.	Sex and Age.	Locality	When Collected.	Received from	Collected by
30,700	..	..	Coban, Vera Paz, [Guat.	Nov. 15, '59.	O. Salvin.	.....

Basileuterus mesochrysus.

Basileuterus mesochrysus, SCLATER, P. Z. S. 1860, 251 (Bogota).

Basileuterus delattrii, SCLATER, P. Z. S. 1855, 144 (Bogota).—CAB. Jour. 1860, 325 (Costa Rica).—? LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama).

Hab. Bogota, to Costa Rica?

(No. 30,491.) General characters of *B. delattrii*, but the wings much longer and more pointed, nearly equal to the entire tail, which is shorter and less rounded; the 1st quill rather longer than the secondaries. There is no appreciable white in the chin; that on the side of the lower jaw is scarcely apparent, and does not extend below the chestnut cheeks. The brown of the crown does not extend so far back on the head, and hence not behind the ears. The upper parts are of a purer olive; beneath of a clearer yellow. the crissum being unicolor with the belly. The quills and tail feathers are darker.

Total length, 4.85; wing, 2.28; tail, 2.50; graduation, .24; difference between 1st and 4th quills, .24; length of bill from nostril, .30; along gape, .55; tarsus, .85.

It is possible that a larger series of typical *B. delattrii* may show that the differences mentioned above are not characteristic, and that the Costa Rican specimens actually belong to *delattrii*. I think, however, they are really different.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,491	131	..	San Jose, Costa Rica.	...	Dr. v. Frantzius.	.....
33,276	..	♂	"	Jan. 12, '62.	J. Carmiol.	.....
30,492	15	..	"	...	"	.....
34,654	..	..	"	...	"	.....
29,553	191	..	"	...	Berlin Museum.	.....
..	123	..	Bogota.	...	Cab. of Lawrence.	.....

(29,553.) Labelled "*B. delattrii.*"

Basileuterus belli.

Muscicapa belli, GIRAUD, Birds Texas, 1841, pl. iv, fig. 1.—*Basileuterus belli*, SCLATER, P. Z. S. 1855, 65; 1859, 374 (Oaxaca).—IB. Catal. Am. Birds, 1861, 35, no. 213 (Orizaba).—SCLATER & SALVIN, Ibis, II, 1860, 31 (Guatemala).

Basileuterus chrysophrys, BONAP. Consp. 1850, 314.—SCLATER, P. Z. S. 1857, 202 (Xalapa).

Hab. Mexico and Guatemala.

(No. 32,468.) Above olive green; crown and cheeks orange brown. Entire under parts, including edge of wings, greenish-yellow, the sides and lining of wings olivaceous. A broad stripe of yellow from the bill over the eye; the two stripes separated on the forehead by black, which is continued, more obscurely, along the top of head, so as to separate the yellow stripe from the brown vertex.

The orange brown of the cheeks extends narrowly above, more broadly below the eye to the bill, involving the lores. The yellow stripe extends on the nape some distance beyond the rufous crown. Bill black; legs yellowish. Wings a little shorter than tail.

Total length, 5.10; wing, 2.28; tail, 2.50; graduation, .32; difference between 1st quill and 4th, .32; length of bill from forehead, .49, from nostril, .28; along gape, .55; tarsus, .80; middle toe and claw, .61.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
26,370	..	..	Mexico.	...	J. Krider.	.....
11,758	..	..	Orizaba.	...	P. L. Sclater.	Botteri?
32,468	1,162	..	"	...	Prof. Sumichrast.	.....
30,699	321	..	Coban, Guat.	Nov. 1859.	O. Salvin.	Salvin & Godman.

MYIOTHLYPIS, Cabanis. (See page 237.)

Myiothlypis, CAB. Mus. Hein. I, 1850, 17. (Type *Trichas nigrocristatus*, LAF.[1])

Bill much depressed, very flat, the culmen and commissure almost truly straight, the bill tapering only gradually to near the tip, where it is more rapidly rounded off, so that the lateral outlines are at first slightly concave, and then convex at the tip, somewhat as in *Todus* or *Todirostrum*, but more tapering. Rictal bristles reaching a little beyond the nostrils. Wings a little shorter than the tail; the 1st to 4th quills much graduated, so that the 1st is equal only to the shortest secondary; the 2d to the 9th quill; the 3d is between the 6th and 7th; the 4th and 5th longest. The tail is moderately graduated, though the feathers are pointed. The legs are stout and strong; the outside of the tarsi apparently with the scutellæ passing entirely round to the posterior edge. Head with a narrow pointed crest.

This is a strongly marked genus, and easily distinguished from *Basileuterus* by the very flat, straight bill, much broader or less

[1] **Basileuterus nigricristatus.**

Trichas nigrocristatus, LAFR. Rev. Zool. 1840, 230 (Bogota).—*Myiothlypis n.* CAB. Mus. Hein. I, 1850, 17.—*Basileuterus n.* SCLATER, Catal. 1861, 36.—*Basileuterus nigricapillus*, SCLATER, P. Z. S. 1860, 74.

attenuated towards the end than in any other *Sylvicolidæ*, and resembling somewhat species of *Todirostrum*. The excessive graduation of the outer quills is another marked feature, although the wing is rather pointed. The peculiarities of the scutellæ, if real and not apparent, point towards the *Tyrannidæ;* although, as far as I can determine, there are but nine primaries. The type species belongs to the Andean region of Ecuador and New Grenada, and is olive green above and on sides, yellow beneath; loral spot, and patch on top of head, black. (30,910. Quito. C. R. Buckalew.)[1]

[1] In the Smithsonian collection is a female bird, collected in Paraguay, by Capt. Page, which resembles somewhat the description by Bonaparte of *Myothlypis luteo-viridis*, from Bogota, in being entirely olive green above, the under parts, with a line from bill over eye (becoming duller behind), yellow; bill horn color; legs yellow. If the *luteo-viridis*, however, be the female of *M. nigricristatus*, as suggested by Bonaparte and Sclater, this specimen cannot belong to it, as it differs entirely in form. The bill resembles that of *Euthlypis lachrymosa*, though not quite so long; it is like that of *M. mitratus*, also, in the straight culmen and gape, but is wider at base, and entirely lacks the *Todirostrum* character of *Myiothlypis nigricristatus*. The wings are considerably shorter than the tail, which is narrow, the feathers much pointed and graduated, as in *Myiothlypis*, but longer (very much as in *Geothlypis*). The wings are less rounded than in *M. nigricristatus*, the 2d quill being a little longer than the 6th, not about equal to the 9th. Length, 5.50; wing, 2.45; difference between 1st and 4th quills, .40; tail, 2.90, its graduation, .35; tarsus, .86; middle toe and claw, .65; bill from gape, .64. There is no indication of crest. (16,334. ♀. Paraguay, June, 1859. Capt. Page, U. S. N., No. 53.)

The relationships of this species are certainly nearest to *Myiothlypis*, differing mainly in longer tail, less graduated wing, and differently shaped lateral outline of bill. To include the two together, the characters of the genus must be considerably modified; somewhat as follows: "Bill much depressed, very broad at base, but thickened; the culmen and commissure straight to near the tip; bristles prominent. Wings shorter than the tail, graduated; the 1st quill not longer than the secondaries. Tail considerably graduated, the feathers acutely pointed."

Both this bird and *M. nigricristatus* would be taken for *Geothlypis*, but for the broad, depressed, bristled bill. The Paraguay bird may be called, provisionally, *M. flaveolus* if not *luteo-viridis*.

SETOPHAGA, Swainson.

SETOPHAGA, Swains.

Setophaga, Swainson, Zool. Jour. III, Dec. 1827, 360. (Type *Muscicapa ruticilla*, L.)—Baird, Birds N. Am. 1858, 297.
Sylvania, Nuttall, Man. Orn. I, 1832. (Same type.)

Bill much depressed, the lateral outlines straight towards tip. Bristles reach half way from nostril to tip. Culmen almost straight to near the tip; commissure very slightly curved. Nostrils oval, with membrane above them. Wings rather longer than tail, pointed; 2d, 3d, and 4th quills nearly equal; 1st intermediate between 4th and 5th. Tail rather long, rather rounded; the feathers broad, and widening at ends, the outer web narrow. Tarsi with scutellar divisions indistinct externally. Legs slender; toes short, inner cleft nearly to base of 1st joint, outer with 1st joint adherent; middle toe without claw, not quite half the tarsus.

The description above given is based upon the type of the genus—*S. ruticilla*. Of the many species referred by authors to *Setophaga* the only one that corresponds with it in most of these characters is the Mexican *S. picta*. This is quite similar in most points, but differs in the wing being a little less pointed, the 1st quill about equal to or a little longer than the 5th. The feet are quite different—the toes being considerably longer, so that the middle toe without claw is two-thirds the tarsus. The claws are proportionally longer, perhaps less curved, and the scutellæ more distinct on the outside of tarsus. The South and Middle American species, heretofore assigned to this genus, are all characterized by peculiar features readily distinguishing them from *S. ruticilla*, and are certainly entitled to subgeneric rank.

As far as I now recollect *S. ruticilla* is the only one of the *Setophageæ* in which the sexes are certainly dissimilar. The rule is the reverse in the other *Sylvicolidæ*.

In the following synopsis I combine the principal species belonging to *Setophaga*, *Myioborus*, and *Euthlypis*:—

a. *End of lateral tail feathers black. Sexes dissimilar.*

Belly white. *Setophaga.*

Ground color black, without vertex spot. Sides of breast and bases of quills and tail feathers reddish-orange in male, yellowish in female . . *ruticilla*, Sw.

b. *Lateral tail feathers, including their tips, white. Sexes similar.*

Belly vermilion- or carmine-red.

Entirely lustrous black, including head and neck. No vertex spot. A white patch on the wings. *Setophaga.*

Forehead black. A broad band on the wings and almost the whole of outer tail feather white . . . . . *picta*, Sw.

Forehead white. A narrow band on the wings and tips only of lateral tail feathers white *antiocior*, Bp.

Plumbeous ash, including head and neck. A chestnut brown vertex-spot. No white on wings. *Myioborus.*

Throat, lores, and forehead continuously pure black. Spot on vertex uniform dark chestnut, scarcely margined on the sides with black. Inner web of outer tail feather white for terminal two-fifths; 3d feather with a distinct white tip. Tail, 3.00 . *miniata*, Sw.

Black of head somewhat tinged with plumbeous; a distinct band of this color extending from bill over the eye, cutting off the black of forehead. Spot on vertex orange chestnut, lighter at base, and quite broadly margined with blackish. White on outer tail feather restricted to terminal third; 3d feather with a small white tip or none. Tail, 2.75 . . *flammea*, Kaup.

Beneath clear yellow, or with a tinge of orange. Crissum whitish. Vertex with an orange brown spot (except in *melanocephala*). Above plumbeous ash. Wings and tail black. *Myioborus.*

Head and neck all round like the back.

Breast and belly gamboge yellow. Forehead and sides of vertex plumbeous. Outer tail feather white for more than terminal third . . . . . *verticalis*, Lafr.

Breast and belly yellowish-orange. Forehead and sides of vertex black. Outer tail feather with less than terminal half white *aurantiaca*, Baird.

Head and neck above like the back. Whole under parts yellow; base of bill above yellow (except in *brunneiceps*). A dusky loral spot. No pectoral collar.

A cinnamon vertex spot encircled by black, extending below and upwards into the eye to the gape. A dusky loral spot. Circum-ocular region, and line to bill

(continuous with it) yellow. Yellow frontlet very narrow . . . . [Sclater.[1] ? "*ruficoronata*,"

Top of head black, without vertex spot. Otherwise like last, but the blackish of cheeks not running below the eye into the dusky lores. (Black confined to vertex, and not reaching occiput as in last?) . . [Tschudi. *melanocephala*,

Whole top of head cinnamon, without encircling black, except a narrow front. Circum-ocular region and line to bill, extending very narrowly along the base of the forehead, white. No yellow at base of bill. Rest of side of head, with line over eye, dark ashy. Middle of back olivaceous . . . . . *brunneiceps*, Lafr.

Similar to the last, but without dusky loral spot, and with a dusky pectoral band.

Entire cheeks yellow . . . . . *torquata*, Baird.

Anterior portion of entire head yellow, bordered behind, above, and on sides by black; the cheeks, forehead, and chin entirely yellow, or with more or less white[2] . . . . . *ornata*, Boiss.

c. *Extreme tips only of lateral tail feathers white. Sexes similar.*

Beneath yellowish; crissum whitish. A median yellow vertex stripe. Above, including wings and tail, plumbeous. *Euthlypis.*

A white spot before the eye. Breast tinged with fulvous . . . . . *lachrymosa*, Bon.

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[1] I have followed some authors, and I think Dr. Sclater, in referring this species to the *S. ruficoronata* of Kaup; but the description of this author is very unsatisfactory, and I doubt very much the correctness of the identification, as the Phila. Academy specimen, like *ornata* with chestnut vertex-patch, answers much better to his diagnosis. Should this suggestion be correct, I am not aware of any published name that properly belongs to the Ecuador bird.

[2] This section includes *S. ornata*, Boiss., *flaveola*, Lafr., and *leucomphomma*, Kaup, the differences of which are not well established, and it is quite possible that all these names refer to one species. In the collection of the Philadelphia Academy is a specimen (without locality) which differs from the common form of *S. ornata* in having a decided chestnut brown patch on the vertex, the anterior feathers in which are tipped slightly with black. The forehead (broadly), the whole side of the head to just behind the eye, and the entire under parts are rich yellowish-orange. In some respects this bird agrees better with *S. ruficoronata*, of Kaup, than the one referred to above.

SETOPHAGA, Sw. (See p. 236.)

Setophaga ruticilla.

Motacilla ruticilla, LINN. S. N. 10th ed. 1758, 186 (Catesby, Car. tab. 67).—*Muscicapa ruticilla*, LINN. S. N. I, 1766, 326.—GMELIN; VIEILLOT, I, pl. 35, 36.—WILS. I, pl. vi, fig. 6.—BON.; AUD. Orn. Biog. I, pl. 40.—D'ORB. Sagra's Cuba, Ois. 1840, 87.—*Setophaga rut.* SWAINS. Zool. Jour. III, 1827, 358.—BON.; AUD. B. A.—SCLATER, P. Z. S. 1854, 111 (Ecuador); 1855, 144 (Bogota); 1856, 92 (Cordova); 1859, 374 (Oaxaca); 1860, 84 (Ecuador), 292.—IB. Catal. 1861, 36, no. 220.—IB. P. Z. S. 1864, 172 (City of Mexico).—SCLATER & SALVIN, Ibis, 1859, 12 (Guatemala).—BAIRD, Birds N. Am. 1858, 297.—MAX. Cab. Jour. 1858, 186.—SALLÉ, P. Z. S. 1857, 231 (St. Domingo).—NEWTON, Ibis, 1859, 143 (St. Croix; winter).—CAB. Jour. 1856, 472 (Cuba); 1860, 325 (Costa Rica).—GUNDLACH, ib. 1861, 326 (Cuba).—BRYANT, Pr. Bost. Soc. VII, 1859 (Bahamas).—LAWRENCE, Ann. N. Y. Lyc. 1861, 322 (Panama R. R.).—*Sylvania rut.* NUTTALL, Man. I, 1832, 291 (type of genus).

Motacilla flavicauda, GMELIN, I, 1788, 997 (♀).

Hab. Eastern and in part middle provinces of North America to Fort Simpson; most of all the West Indies; Mexico to Ecuador.

Specimens in the collection from many localities in the eastern United States as far west as the valley of the Missouri; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,638	26	♀	Moose Factory.	May 26, '60.	C. Drexler.	C. Drexler.
20,637	669	♀	Rupert House.	Sept. 3, '60.	"	"
19,528	402	♂	Fort Simpson.	June 7.	B. R. Ross.	B. R. Ross.
19,528	532	♂	Fort Resolution.	May 23, '60.	R. Kennicott.	R. Kennicott.
4,689	..	..	Mouth of Platte.	April 26.	Lt. Warren.	Dr. Hayden.
4,688	..	..	Mouth of Big Sioux.	...	"	"
19,205	24	♂	Wind River Mts.	May 25, '60.	Capt. Raynolds.	"
19,206	34	♀	"	"	"	"
11,060	..	♂	Fort Bridger, Utah.	May 27.	C. Drexler.	C. Drexler.
34,512	32	♀	Nassau, N. P.	May 14, '64.	Lt. Fitzgerald.	.....
23,538	..	♀	Monte Verde, Cuba.	Sept. 4, '61.	C. Wright.	C. Wright.
23,540	..	..	Monte Libon, Cuba.	Sept. 25, '61.	"	"
21,656	..	♀	Tuabeque, Cuba.	...	"	"
21,658	..	♂	Filanthropia, Cuba.	Dec. 8.	"	"
23,320	..	♂	Trelawney, Jam.	Nov. 20, '58.	P. L. Sclater.	W. Osburn.
24,362	44	♂	Spanishtown, Jam.	Sept. 1861.	W. T. March.	W. T. March.
26,967	..	..	St. Thomas.	...	J. Akhurst.	.....
36,641	..	..	"	...	Robert Swift, [ton.	.....
..	..	..	St. Croix.	Mar. 16, '58.	Cab. A. & E. New-	.....
30,706*	3,095	♀	Belize, Hond.	Dec. 14, '57.	O. Salvin.	.....
30,706	338	♂	Petaleulu, Guat.	Sept. 1862.	"	.....
34,660	..	♂	Barranca, C. R.	Mar. 13, '64.	J. Carmiol.	.....
34,661	..	♂	"	"	"	.....

Setophaga picta.

Setophaga picta, SWAINS. Zool. Ill. 2d series, I, 1829, pl. iii.—KAUP, P. Z. S. 1851, 50.—SCLATER, P. Z. S. 1856, 66; 1858, 299 (Oaxaca).—IB. Catal. 1861, 36, no. 221 (Guatemala).—BAIRD, Birds N. Am.

1858, 298, pl. lxxvii, fig. 2.—SCLATER & SALVIN, Ibis, 1859, 12 (Guatemala).

Muscicapa leucomus, GIRAUD, Birds Texas, 1841, pl. vi, fig. 1.—SCLATER, P. Z. S. 1855, 66.

Hab. All Mexico and Guatemala.

General color, including sides of body, lustrous black. Eyelids, a large patch on the wing, involving the greater and middle coverts, the edges of the secondaries, the inside of wings, axillars, crissum, tibiæ, outer tail feather except at base, and a diminishing space on the second and third, white. Middle of breast and abdomen carmine red. Wings and tail equal.

The white of the crissal feathers is confined to the tips, the rest being black, sometimes showing in the white. The fourth tail feather sometimes has a slight white tip; the second feather is almost entirely white.

I have seen no specimen marked as the female of this beautiful species, but that sex probably differs only in a less intense coloration, and more restricted amount of white. There is no appreciable difference between Mexican and Guatemalan skins.

Length (34,020), 5.00; wing, 2.70; tail, 2.70; tarsus, .65

This species differs in form from *S. miniata* in longer wings and shorter tail—the two being about equal, instead of the tail being considerably the longer. The tarsi of this species are also shorter.

Setophaga multicolor, Bon.,[1] from Mexico, seems to differ in having the forehead white, the white of the wings narrower, that of the tail more restricted, the belly white. The species appears to be entirely unknown, except from Bonaparte's description.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
4,014	144	♂	Boqeillo, New Leon.	April, 1853.	Lt. D. N. Couch.	.....
34,020	113	♂	Mazatlan. (Sierra	Dec. 1861.	A. J. Grayson.	.....
13,628	..	..	Guatemala. [Madre.)	...	J. Gould.	.....
30,705	340	..	Volcan de Fuego, [Guat.	1862.	O. Salvin.	Salvin & Godm.

(4,014.) Eyes brown.

MYIOBORUS, Baird. (See page 237.)

Myioborus, BAIRD. (Type *Setophaga verticalis*, Sw.)

Rictal bristles very long, reaching to the end of the bill; the toes more as in *ruticilla*, though longer, the middle toe without claw about three-fifths the tarsus. The wings are shorter than the broad, soft, rounded tail, and the wing is much rounded; the 4th quill longest, the 1st about equal to the 7th.

[1] **Setophaga multicolor.**

Setophaga multicolor, BON. Conspectus, 1850, 312. Mus. Senck.

Hab. Mexico.

The species of this section have been usually referred to *Setophaga*, but differ very appreciably as indicated. I have, however, combined them in the same analytical arrangement under *Setophaga* for convenience of diagnosis. The following are the better known species of *Myioborus* from South America (see page 253):—

Setophaga verticalis.

Setophaga verticalis, LAFR. & D'ORB. Syn. Av. 1837, 50.—D'ORB. Voy. Ois. 330, pl. 35, fig. 1.—SCLATER, Catal. 1861, 37, no. 225.

Hab. Bogota and Ecuador. Specimens in collections of Smithsonian Inst., Phila. Acad., and G. N. Lawren

Setophaga ————.

?*Setophaga ruficoronata*, SCLATER P. Z. S. 1855, 144, etc., and Catal. 1861, 37, no. 226 (not of Kaup?).

Hab. Ecuador. Specimens in collections of Smithsonian Inst. (Ecuador, from C. R. Buckalew), Phila. Acad., and G. N. Lawrence.

Setophaga melanocephala.

Setophaga melanocephala, TSCHUDI, Consp. Fauna Peruana, 1845–6, 192, tab. xii (Peru).

Hab. Peru. Cab. Phila. Acad.

Setophaga ruficoronata.

?*Setophaga ruficoronata*, KAUP, P. Z. S. 1851, 49.—BON. Obs. Delattre, 1853, 63.

Hab. Bogota. Cab. Phila. Acad.

Setophaga ornata.

Setophaga ornata, BOISS, R. Zool. 1840, 70 (Bogota. Face and forehead white).

Setophaga flaveola, LAFR. R. Zool. 1844, 81 (Bogota. Face and forehead yellow). Cab. Phila. Acad.

?*Setophaga leucomphomma*, KAUP, P. Z. S. 1851, 227 (Bogota).

Hab. Bogota. Cab. Phila. Acad.

Setophaga brunneiceps.

Setophaga brunneiceps, LAFR. & D'ORB. Syn. Av. 1837, 50.—D'ORB. Voy. Ois. 329, pl. 29, fig. 3 (Bolivian Andes).—*Basileuterus brunneiceps*, BON. Consp. 1850, 314.

Hab. Bolivia. Cab. Phila. Acad.

This bird is quite different in form from the preceding species; its narrower bill, shorter wings, color of head and back, etc., approximating it to *Basileuterus*, although its longer, broad graduated tail, with the white lateral tail feathers, are as in *Myioborus*.

Setophaga castaneo-capilla.

Setophaga castaneo-capilla, CAB. Schomburgk's Guiana, III, 1848, 667 (Roraima, Guiana).

This species has usually been assumed as identical with the preceding, although judging from the description alone, it appears quite distinct. The essential features consist in having the crest chestnut brown, the forehead, sides of neck and back with faint wash of olivaceous. The outer tail feather has the outer web and the tip of the inner white; the second with a large white spot inclosed by black; the third white only at tip. Nothing is said of the black forehead, nor of the white lines of the face and front. There is much less white also on the lateral tail feathers.

Setophaga miniata.

Setophaga miniata, SWAINS. Philos. Mag. I, 1827, 368.—BAIRD, Birds N. Am. 1858, 249, pl. lviii, fig. 1.—SCLATER, P. Z. S. 1856, 292 (Cordova); 1858, 299 (Oaxaca).—IB. 1859, 363 (Xalapa).—IB. 1864, 173 (City of Mexico).—IB. Catal. 1861, 37, no. 222.

Muscicapa vulnerata, WAGLER, Isis, 1831, 529.—*Setophaga vul.* BON. Consp. 1850, 313.—*Setophaga castanea*, LISSON, R. Z. 1839, 42.

Muscicapa derhami, GIRAUD, Birds Texas, 1841, pl. iii, fig. 2.—SCLATER, P. Z. S. 1855, 65.

Hab. Mexico.

(No. 13,668.) Above dark bluish-ash; the quills dark brown; the tail black. A square patch of dark chestnut brown on the vertex; the forehead anterior to this, lores, circum-ocular region, cheeks beneath the eye, whole fore neck and sides of jugulum, black; rest of under parts rich carmine red, except inside of wings and crissum, which are white. Tibiæ plumbeous. The exposed portion of outer web, and exposed half of inner, of the lateral tail feather, white, the amount of white successively more restricted on the 2d and 3d feathers. Wings considerably shorter than the tail. Bristles reaching to end of bill.

Female similar to male in color.

Length, 5.10; wing, 2.55; tail, 3.00; tarsus, .75.

A specimen (No. 558, type of *Muscicapa derhami*) less mature, or possibly a female, has the black feathers of the forehead and throat edged with plumbeous; the sides of the head are plumbeous. This bird is the one described in Birds N. Am.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from.	Collected by
558	..	..	N. E. Mexico.	...	S. F. Baird.	J. G. Bell.
13,668	..	..	Jalapa.	...	P. L. Sclater.	D'Oca.
37,496	62	♀	Orizaba, Mex.	Jan. 30, '65.	Prof. Sumichrast.	.....

(558.) A type specimen of *Muscicapa derhami*, Giraud.

Setophaga flammea.

Setophaga flammea, KAUP, P. Z. S. 1851, 50 (Guatemala); P. Z. S. 1855, 77 (references to priority).—SCLATER, Catal. 1861, 37, no. 223.—

SCLATER & SALVIN, Ibis, 1859, 12 (Guatemala).—CABANIS, Jour. IX, 1861, 85 (Costa Rica).

Setophaga intermedia, HARTLAUB, R. Z. 1853, 3.

Hab. Guatemala; Costa Rica (Cab.).

It is with much hesitation that I admit this as a distinct species, and do so mainly because Dr. Sclater, who has seen many specimens of the two allied forms, considers them different. The most highly plumaged specimen before me differs from the *S. miniata*, as just described, in the red of the belly being more vermilion than carmine. The black on the throat and forehead is less intense; on the side of the head it is mainly confined to the region below and anterior to the eye, the plumbeous ground color extending in quite a broad and distinct band from the bill over the eye. The chestnut of the feathers of the vertex is lighter, and of a yellowish shade at the basal portion, while in *miniata* it is unicolored; it is more restricted in extent, being bordered on each side by quite a broad band of black. The white of tail is more restricted, only one-third the inner web of outer feather being involved instead of two-fifths, and rarely extending on the third feather. The bill is perhaps a little broader, the tail and wings shorter, the tail feathers narrower.

A female, as marked by Mr. Salvin, differs from the male only in having a still greater mixture of plumbeous in the black of the forehead.

Length of 20,400, ♂, 5.10; wing, 2.45; tail, 2.70; tarsus, .72.

The *S. intermedia*, of Hartlaub, was probably based upon a female bird—the diagnosis of plumbeous throat, concolor with the back and forehead, not being applicable to the male. Kaup's diagnosis of tips only of the outer three tail feathers white is not very distinctive, as there is comparatively little difference in this respect from *miniata*.

From a statement by Mr. Sclater, in the Pr. Z. S. 1855, 77, it appears that the name of Kaup, though presented to the Zool. Soc. in 1851, was not actually published until after that of Hartlaub, in 1853. It is, therefore, a question whether the latter should not have priority. As, however, there is no internal evidence or external indication apart from the claim of Dr. Hartlaub and the unofficial admission of Sclater to prove the fact, I retain the name of *flammea*, regretting at the same time that the actual date of issue of the sheet containing the description was not in some way noted upon it.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,665	..	..	Guatemala.	...	P. L. Sclater.	.....
18,567	..	..	"	...	"	.....
8,021	..	..	"	...	J. Gould.	.....
20,400	1,469	..	Coban, Guat.	Nov. 1859.	O. Salvin.	.....
20,589	1,468	..	"	"	"	.....
30,704	348	..	"	"	"	.....
..	130	..	Guatemala.	...	Cab. Lawrence.	.....

Setophaga aurantiaca.

Setophaga aurantiaca, BAIRD, n. s.

Hab. Costa Rica.

Upper parts, with head and neck, plumbeous, without any tinge of olive; wings and tail black, the quills edged slightly with plumbeous. Crown orange brown, margined on the forehead and above the eyes with black. Fore part of the neck blackish. Beneath yellowish-orange; the crissum and inside of wings white; the tibiæ and edge of wing plumbeous. Rather less than the terminal half of outer tail feather, and a diminishing amount on the second and third feathers, white, the white extending farther towards the base on the outer webs of the outer feather; the black extending forwards externally on the edge of the second and third feathers. Iris black.

The sexes do not appear to differ. Some specimens are, however, of a deeper orange. A young bird (30,493), not fully fledged, is very similar, but lacks the brown crown. The orange of the under parts is very deep and distinct.

Length (No. 33,280, ♀), 5.00; wing, 2.45; tail, 2.57; gape of bill, .60; tarsus, .75.

This species is very similar to *S. verticalis*, of Bogota, but differs in having the under parts yellowish-orange, rather than clear gamboge yellow. The throat is apparently darker. The black of the forehead and sides of the vertex-spot I do not find in the specimen before me of *verticalis*, nor are they mentioned in the descriptions. There is more white on the tail feathers of *verticalis*, involving more than half of the inner web and two-thirds of the outer. There is no trace in *aurantiaca* of the ashy margins of the tail feathers mentioned by D'Orbigny.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,493	101	Juv.	Costa Rica.	...	Dr. v. Frantzius.	.....
33,280	8	♀	Dota Mts., C. R.	Jan. 23, '64.	J. Carmiol.	J. Carmiol.
33,279	8	..	"	"	"	"
33,277	8	♀	"	Jan. 23, '64.	"	"
33,291	8	♂	"	Jan. 27, '64.	"	"
33,278	8	♂	"	"	"	"
33,282	8	♀	"	Jan. 24, '64.	"	"
34,658	..	♂	San Jose.	Mar. 4, '64.	"	"
34,659	..	♂	Barranca.	Mar. 12, '64.	"	"

Setophaga torquata.

Setophaga torquata, BAIRD, n. s.

Hab. Costa Rica.

Upper parts, continuous with a narrow pectoral collar ashy plumbous, with a tinge of olive above; the collar more dusky. A narrow frontal line, entire sides of head, including lores and circum-ocular region, and under parts, bright yellow. Crissum and inside of wings pale yellowish; edge of wing darker

yellow. Vertex with the feathers considerably elongated, and orange brown, margined all round with black. Quills and tail feathers black, not appreciably margined. Outer tail feather with all the exposed portion white; less of this color on the second, with a margin of black on the outer web near the end; third feather with a small stripe of white in the end. Tibia greenish plumbeous.

In one specimen the forehead only (except the narrow line at base of bill) is black, and the black line above the superciliary yellow is quite narrow; in another, the decumbent brown crest is mainly on the sinciput, the black anterior and lateral to it being in considerably less extent. An immature specimen, not fully fledged, probably of this species, lacks the spot on the vertex; the whole jugulum is dusky, this color extending forward along the throat to the bill; the lores and a crescentic patch beneath the eye are dusky.

Length, 5.50; wing, 2.75; tail, 2.85; bill from gape, .56; tarsus, .80.

The clear yellow face without any dusky marks, and the yellow under parts crossed by a dusky pectoral collar, appear to distinguish this species from all its congeners.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,496	97	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
30,495	98	..	"	...	"	.....
30,494	99	..	"	...	"	.....
32,283	..	..	"	...	J. Carmiol.	J. Carmiol.

EUTHLYPIS, Cabanis. (See page 237.)

Euthlypis, CABANIS, Mus. Hein. 1850, 18. (Type *E. lachrymosa*, CAB.)

Bill much depressed, and lengthened; from forehead as long as the head, the lateral outline rather concave near the end. Rictal bristles reaching half way from nostrils to tip of bill. Culmen and commissure gently curved. Tail rounded, and a little longer than the wings, the feathers moderately broad. Wings rounded; 1st quill about equal to the 6th; 3d and 4th longest. Proportions of feet about as in the rufous crowned *Myioborus*.

This subgenus, besides its relations to *Setophaga*, has characters belonging both to *Myioborus* and *Myiodioctes*. The tail feathers have the firmness and comparative narrowness of outer web of the latter, the feet and rounded wings of the former. The bill is more lengthened than in either.

But a single species of this subgenus is known. It is the largest of the *Setophagæ:* yellow beneath, plumbeous above, with two dark stripes on the head inclosing a median yellow one.

Setophaga lachrymosa.

Basileuterus lac. Bon. Consp. 1850, 314 (from spec. in Berlin Mus.).—*Euthlypis lac.* Cab. Mus. Hein. 1850, 19 (Lagunas, Mex.; same as Bonaparte's spec.)—Sclater, P. Z. S. 1856, 291 (Cordova); 1859, 363 (Jalapa).—Ib. Catal. 1861, 36, no. 219.—Sclater & Salvin, Ibis, 1860, 274 (Alotenango, Guat., Sept. 1859).

Setophaga lachrymosa, Baird.

Hab. Eastern Mexico and Guatemala.

Above, including top and sides of head, olivaceous-plumbeous; wing and tail feathers almost black, edged on outside with plumbeous. Beneath yellow, the breast, jugulum, and flanks washed with ochry. Crissum dirty white; tibiæ and inside of wings tinged with olive. Feathers along base of upper mandible, with loral region and two stripes on top of head, black, the latter inclosing a broader median one of yellow. A spot in front of eye, and eyelids white. A white spot at end of all the tail feathers, principally on the inner web, and decreasing in magnitude from outermost to middle. Bill black; legs pale.

Length, 6.10; wing, 2.75; difference between 1st and 4th quills, .25; tail, 2.90; graduation, .35; bill above, .60, from nostril, .36, from gape, .70; tarsus, .90; middle toe and claw, .73; claw, .24; hind toe and claw, .50.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,705	..	..	Mexico [Guat.	...	A. Sallè.	.....
30,701	331	..	Savaña Grande,	1862.	O. Salvin.	.....

CARDELLINA, Dubus.

Cardellina, Dubus. (See page 236.)

Cardellina, "Dubus," Bon. Consp. 1850, 312. (Type *Cardellina amicta*, Dubus = *Muscicapa rubrifrons*, Giraud.)

Bill Parine in appearance, much shorter than head, high at base, and the culmen considerably decurved throughout; the commissure curved and somewhat angulated in the middle. Rictal bristles stiff, but not very long, hardly reaching half way from the nostrils to tip of bill, which exhibits scarcely any trace of notch. Wings long and pointed; the 2d, 3d, and 4th quills nearly equal and longest; the 1st a little longer than the 5th. The tail is shorter than the wings, nearly even, a very little rounded. Feet small; tarsi short, the scutellar divisions indistinct externally; the middle toe without claw little more than half the tarsus.

This form agrees very closely in the characters of wing and tail with *Myiodioctes mitratus*. The legs, however, are shorter, and the bill very differently shaped, more like that of a Titmouse.

Cardellina rubrifrons.

Muscicapa rubrifrons, GIRAUD, Birds Texas, 1841, pl. vii, fig. 1 (N. E. Mexico).—*Cardellina rubrifrons*, SCLATER, P. Z. S. 1855, 66; ib. 1858, 299 (Oaxaca); 1859, 374 (do.).—IB. Catal. 1861, 37, no. 229.
Cardellina amicta, ("DUBUS, MSS."), BON. Consp. 1850, 312.
Parus erythropis, LICHT. MSS. (Mus. Berlin).

Hab. Mexico and Guatemala.

(No. 29,708.) Above grayish-ash; a nuchal patch, rump and under parts, white, more or less tinged with rosy. Head and neck all round bright red, crossed however by a hood of black on the top of head, passing down over the ears, leaving the forehead, lores, eyelids, and sides of the neck red. There is no red on the occiput, the white of the nape immediately succeeding the black. Inside of wings white, and an ashy white band across the median wing coverts. Sides of body ashy. Female similar, but duller in color.

Length, 5.00; wing, 2.77; tail, 2.75; graduation, .14; difference between 1st and 3d (longest) quills, .12; bill from forehead, .45, nostril, .27, gape, .48; tarsus, .70; middle toe and claw, .54.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,708	..	..	Mexico.	...	A. Sallé.	.....
30,702	360	♀?	Totonicapam, Guat.	Oct. 1862.	O. Salvin.	.....

ERGATICUS, Baird.

Ergaticus, BAIRD. (Page 237.) (Type *Setophaga rubra*, Sw.)

Bill very short, and rather slender; the culmen, however, and commissure curved from the base. Rictal bristles well developed, reaching midway from nostril to tip. Wings rather shorter than the nearly even, somewhat rounded tail; the 3d and 4th quills about equal; the 1st a little shorter than the 6th. Tarsi lengthened; the middle toe without claw half the tarsus.

This form differs from typical *Cardellina* in much slenderer, though somewhat similarly shaped bill, greater development of rictal bristles, considerably shorter and more rounded wings, etc. In some respects it resembles the section *Idiotes* of *Basileuterus*, but may properly be separated.

Cardellina rubra.

Setophaga rubra, SWAINS. Phil. Mag. I, 1827, 368 (eastern Mexico).—CASSIN, Ill. Birds Cal. Texas, I, 1854, 266, pl. xliii.—*Cardellina rubra*, BON. Consp. 1850, 312.—SCLATER, P. Z. S. 1856, 292 (El

Jacale, Mex.); 1858, 299 (Oaxaca); 1859, 363, 374 (Xalapa, Oaxaca); 1864, 173 (City of Mexico).—IB. Catal. 1861, 38, no. 230.
—*Basileuterus ruber*, CAB. Mus. Hein. 1851, 18.

Sylvia miniata, LAFR. Mag. Zool. 1836, pl. liv.

Parus leucotis, GIRAUD, Birds Tex. 1841, pl. iv, fig. 2 (N. E. Mexico).

Hab. Mexico.

(No. 13,666.) Rich carmine red, rather darker on the back. Ear coverts silvery white. Wing and tail feathers brown, edged externally with the colors of the back. Larger inner wing coverts rosy white. Bill pale horn color, dusky above. Legs pale. Sexes similar.

Length, 4.70; wing, 2.40; tail, 2.55, its graduation, .20; difference between 1st and 4th quills, .30; bill from nostril, .27, gape, .50; tarsus, .77; middle toe and claw, .56.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
561	..	..	N. E. Mexico.	...	S. F. Baird.	.....
32,717	45,850	♂	Mexico.	...	Verreaux.	.....
13,666	..	..	Xalapa.	...	Sclater.	D'Oca.
32,718	..	Juv.	"	...	Verreaux.	.....
35,140	184	♂	Mirador (pines).	June 1864.	Dr. Sartorius.	.....
37,495	112	♂	Orizaba (highlands).	...	Prof. Sumichrast.	.....

(561.) Type specimen of *Parus leucotis*, Giraud.

Cardellina versicolor.

Cardellina versicolor, SALVIN, P. Z. S. May, 1863, 188, pl. xxiv, fig. 4 (Volcan de Fuego, height of 8,000 feet, and Totonicapam).

Hab. Highlands of Guatemala.

(No. 30,703, ♀.) General color red; darker on back, paler on the rump and beneath; the feathers of the head and neck all round, and the breast tipped with silvery rose-color. Wing and tail feathers dark brown, edged externally with red; lining of wings rosy white. Bill and legs dark horn color. Male probably similar, or with colors more intense.

Length, 4.80; wing, 2.30; tail, 2.50, its graduation, .24; difference between 1st and 4th quills, .32; bill from nostril, .27; tarsus, .74.

This species is very similar in size and form to *C. rubra*, differing in color mainly in having a silvery tinge to the red of the whole head, neck, and breast, instead of pure silvery ears.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,703	337	♀	Totonicapam, Guat.	Oct. 1862.	O. Salvin.	Salvin & Godman.

The following are some synonyms of presumed North or Middle American *Sylvicolidæ* of older authors, not satisfactorily identified.

Sylvia decurtata, Bon. Pr. Zool. Soc. 1837, 115.—*Pachysylvia decurtata*, Bon. Consp. 1850, 309.

Hab. Mexico.

Probably *Hylophilus cinereiceps*.

Motacilla fulva, Gmelin, I, 1788, 973.—*Sylvia fulva*, Lath. Ind. II, 1790, 542 (Louisiana).

Sylvia griseicollis, Vieillot. Ois. Am. Sept. II, 1807, 29, pl. 87.

Sylvia ochroleuca, Vieill. Nouv. Dict. XI, 1817, 187 (United States). (*Vireo fuscifrons?*)

Sylvia pumila, Vieill. Ois. Am. Sept. II, 1807, 39, pl. 100 (St. Domingo, Cayenne, etc.).

Sylvia russeicauda, Vieill. Ois. Am. Sept. II, 1807, 17, pl. 71 (Penna.).

Sylvia semitorquata, Lath. Ind. Orn. II, 1790, 542 (Louisiana).

Sylvia virescens, Vieill. Ois. Am. Sept. II, 1807, 42 (America).

Note.—Specimens received since the preceding account of the *Sylvicolidæ* went to press furnish the occasion for the following observations and corrections:—

Parula pitiayumi. Page 170.

Among the collections made during the past winter, by Col. Grayson, in the Tres Marias, Mex., were several specimens of a *Parula*, which I cannot separate from the true South American *P. pitiayumi*; differing only in rather larger size and less amount of black in the loral region, which, in fact, is nearly as plumbeous as the forehead, the space immediately anterior to and beneath the eye being blackish. The upper parts appear rather paler than usual. They differ from the Guatemalan and Costa Rican *inornata* in the larger size and possession of two white bands across the wings. The species has not been identified as occurring on the main land of Mexico.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
37,315	88	..	Tres Marias, Mex.	Jan. 1865.	Col. A. J. Grayson.	.....
37,316	..	..	"	"	"	.....

Seiurus aurocapillus. Page 214.

Among the collections made at Mazatlan, Mex., by Col. Grayson, is a specimen, 37,317 (376) of this species, not previously recorded

as occurring on the Pacific slope of the continent. In the fact of its being a bird of the eastern province of the United States during summer, and in winter crossing the mountains of northern Mexico to the Pacific coast, it appears to resemble *Dendroica dominica*, *Mniotilta varia*, *Larus atricilla*, *Sterna antillarum* and *anglica*, etc., none of which are known on the California coast at any season.

Dendroica chrysopareia. Page 183.

Dr. Sclater has recently stated that the specimens referred to (p. 185) as from San Antonio, Texas, are true *D. chrysopareia*, and thus the species is to be included in the fauna of the United States.

Family HIRUNDINIDÆ.

Bill short, triangular, very broad at base (nearly as wide as long) and much depressed, narrowing rapidly to a compressed, notched tip; mouth opening nearly to the eyes. Primaries nine, graduating rapidly less from the exterior one; tail feathers twelve.[1] Feet weak; tarsi scutellate, shorter than middle toe and claw. Number of joints in toes normal; basal joint of middle toe partially or entirely adherent to lateral toes. Wings long, falcate. Tail forked. Eyes small. Plumage compact, usually lustrous. All the American species with a white patch on the sides under the wing?

The *Hirundinidæ* form a very well marked group of birds easily distinguished from all others. They exhibit a close resemblance, in external appearance and habits, to the *Cypselidæ;* from which, apart from the internal structure, they are readily distinguished by the possession of nine, instead of ten primaries; twelve, instead of ten tail feathers; scutellate tarsi, toes with normal number of joints (1. 2. 3. and 4., respectively, exclusive of ungual phalanges), instead of a different proportion; differently shaped nostrils, etc. In both families the wings are developed to an extraordinary degree; the outer primary nearly twice or more than twice the length of the inner, and enabling its possessor to sustain flight almost indefinitely. The relations of the family among the Oscines appear closest to the old-world *Muscicapidæ*.

The precise character of scutellation of tarsus is somewhat difficult

[1] Of the two specimens of *Atticora fasciata* before me, neither has more than ten tail feathers. I do not know whether this is characteristic of the species or not.

to make out, owing to a tendency to fusion of the plates, although not essentially different from most Oscines. There is a series of scutellæ along the anterior face of the tarsus, and a longitudinal plate on each side, meeting but not coalescing behind. The anterior scutellæ sometimes appear to fuse into the outer lateral plate; or sometimes the latter is more or less subdivided; the inner plate is generally more distinct from the anterior scutellæ, and usually entire, except perhaps at the lower extremity.

In comparing the wings of the *Hirundinidæ* with those of the *Cypselidæ*, we readily notice one of the essential characters of the Oscines, viz., that the greater wing coverts hide only half or less than half of the secondary quills, instead of reaching much beyond their middle, or nearly to the end. (See Sundevall, Ornith. Syst.)

There are many species of *Hirundinidæ* in America—some more or less local, others with wide range. One of these species—*Cotyle riparia*—is believed to be identical with a European; and one—*H. erythrogaster* (*horreorum*, also, if distinct)—is generically inseparable from the European *H. rustica*. The other genera are not represented in Europe, though *Petrochelidon* has at least one Australian example (*P. nigricans*).

Most of the genera of American *Hirundinidæ* are widely diffused over the whole continent—the *Atticora* group alone not extending north of Central America.

In America we have nothing corresponding to the European genus *Chelidon* (*C. urbica*), characterized by having the tarsi and toes covered with feathers to the claws, as in *Lagopus* (the soles bare).

The American *Hirundinidæ* vary considerably in reference to the character of the nostrils, whether superior or lateral, with or without membrane: the comparative length of tarsus, toes, and claws: the amount of adhesion of middle toe to lateral: the feathering of the tarsus: depth of fork of tail, etc., these features applying to the different groups somewhat as follows:—

Nostrils superior; broadly oval; not overhung by membrane on inner and upper side, especially anteriorly: *Progne, Petrochelidon, Atticora, Stelgidopteryx.*

Nostrils lateral; overhung or bordered internally by membrane, which is straight edged above or internally, and directed either parallel with axis of bill, or diverging from it: *Hirundo, Tachycineta*, and all other American genera, except those of first section.

Bill very stout; the culmen and commissure much decurved, so that the chord of the latter includes lower jaw, in *Progne* and *Phæoprogne*. In

all others the bill weaker, more depressed, the commissure nearly straight to near the tip.

The middle toe is lengthened; the tarsus equal to the toe without the claw, its joint with tibia having overhanging feathers attached, which extend on the inner face of the tarsus a short distance, in *Hirundo*, *Tachycineta*, *Pterochelidon*, *Progne*. Tarsus similarly feathered, but proportionally longer—being equal to middle toe and half the claw, in *Neochelidon*, *Atticora*, *Pygochelidon*, and *Stelgidopteryx*. It is of the same proportion, but entirely bare of feathers in *Callichelidon* and *Notiochelidon*.

In *Cotyle* alone are there short feathers attached to the posterior face of tarsus near the lower end. Here also alone the lateral claws are very long, reaching considerably beyond the base of the middle claw.

In *Progne* and *Phæoprogne* the basal joint of middle toe is adherent but little more than half way externally, about half way internally; almost the same on both sides. In almost all the rest it is adherent externally nearly to the end, and about half way internally, except in *Tachycineta thalassina*, where the adhesion is complete on both sides, except at the end of the inner; in *Neochelidon* and *Notiochelidon*, where the basal and half the middle joint: and in *Atticora*, where the basal and the whole middle joint are adherent externally.

In *Stelgidopteryx* the edge of the wing (outer edge of outer primary) is provided with a series of stiff recurved hooks; in all other American genera these are entirely wanting, though said to exist in the African genus *Psalidoprocne*, Cab.

The following synopsis may aid in determining the genera and subgenera of American *Hirundinidæ*, although the succession is not strictly natural:—

Nostrils broadly oval, or circular; opening upwards and forward, and exposed; without overhanging membrane.

Edge of wing smooth. Tarsus short, stout; equal to middle toe without claw; feathered on the inner side above. Nostrils almost or entirely without membrane.

Bill stout; culmen and commissure much curved. Frontal feathers without bristles. Tail deeply forked. Color lustrous black; belly and crissum sometimes white . . . *Progne*.

Similar to last, only culmen straight to near tip; tarsus with feathers along inner edge for basal half or two-thirds. Fork of tail shallow. Color mouse brown above; white beneath . . . . . *Phæoprogne*.

Bill rather weaker; commissure and culmen nearly straight to near tip. Frontal feathers bristly. Tail nearly even. Throat, rump

and crissum, and usually forehead, rufous; belly white . . . . . *Petrochelidon.*

Edge of wing smooth. Tarsus longer than in last; equal to middle toe and half the claw. Nostrils bordered along posterior half by membrane, but not overhung internally. Bill very small. Tail forked. Crissum dusky, except *Neochelidon fucata.*

Basal and whole of next joint of middle toe adherent externally to outer toe. Tail very deeply forked.

Tarsus feathered at upper end internally *Atticora.*

Basal and half the next joint of middle toe adherent externally to outer toe.

Tarsus entirely bare . . . . *Notiochelidon.*

Tarsus with feathers on inner face at upper end . . . . . *Neochelidon.*

Basal joint only of middle toe adherent externally, and free at extreme end.

Tibial joint covered with feathers which extend a short distance along inner face of tarsus . . . . . *Pygochelidon.*

Edge of wing armed with stiff recurved hooks. Tarsus as in preceding (tarsus and toes much as in *Pygochelidon*). Bill larger and more depressed. Tail emarginate only. Crissum white . . . *Stelgidopteryx.*

Nostrils lateral; bordered behind and inside, or overhung by membrane, the outer edge of which is straight, and directed either parallel with axis of bill or diverging from it.

Tarsus short; about equal to middle toe without claw. Tibial joint feathered; feathers extending along inside of upper end of tarsus.

Tarsus bare at lower end. Lateral claws reaching only to base of middle.

Tail very deeply forked, much longer than closed wings; lateral feathers linear, and very narrow at end, twice the length of central. Upper parts and pectoral collar steel blue; front and throat, sometimes under parts, rufous. Tail feathers with large spots . . *Hirundo.*

Tail with shallow fork, not exceeding half an inch, shorter than closed wings. Feathers broad. Color blue or green above, with or without white rump; white beneath . . . . . *Tachycineta.*

Tarsus with a tuft of feathers at lower end.

Lateral claws lengthened, reaching beyond base of middle claw.

Tail slightly forked. Color dull brown above; beneath white, with brown pectoral collar . . . . . *Cotyle.*

Tarsus long; equal to middle toe and half claw; entirely bare. Tail considerably forked, about equal to closed wing. Color green above; white beneath . *Callichelodon.*

The arrangement and subordination of forms which I propose to adopt in the further consideration of the subject, as expressing more nearly the affinities of the American *Hirundinidæ*, is as follows:—

Progne. Largest size. Commissure sinuated and much arched from base. (Only here). Nostrils superior. Frontal feathers soft.

Subdivisions *Progne*, *Phæoprogne*.

Petrochelidon. Commissure almost straight to near tip. Bill large. Nostrils superior, not? overhung. Frontal feathers bristly. Legs bare. (Only here.) Rump rufous.

Subdivision *Petrochelidon*.

Chelidon. Nostrils superior, but slightly overhung. Legs feathered to claw. (Here only.) (European exclusively.) Rump and under parts white.

Hirundo. Nostrils lateral; overhung by membrane. Lower end of tarsus bare. Rump white, or else like the back. Crissum white, or rufous.

Subdivisions *Hirundo*, *Tachycineta*, *Callichelidon*.

Atticora. Smallest size. Nostrils superior, not overhung. Bill very small. Crissum mostly black. Middle toe usually adherent beyond basal joint, except *Pygochelidon*. (Here only.)

Subdivisions (*Cheramœca*?), *Pygochelidon*, *Atticora*, *Notiochelidon*, *Nevchelidon*.

Stelgidopteryx. Nostrils superior, not overhung. Edge of wing scratchy and rough. (Here only.) Crissum white.

Subdivisions *Stelgidopteryx* (*Psalidoprocne*?).

Cotyle. Nostrils lateral, overhung by membrane. Lower end of tarsus with a tuft of feathers, and lateral claws reaching beyond base of middle. (Here only.) Crissum white.

Subdivision *Cotyle*.

PROGNE, Boie.

Progne, Boie, Isis, 1826, 971. (Type *Hirundo purpurea*, L. (*H. subis*, L.)) –Baird, Birds N. Am. 1858, 314.

Body stout. Bill robust, lengthened; lower or commissural edge of maxilla sinuated, decidedly convex for basal half, then as concave to the tip, the

lower mandible falling within its chord. Nostrils superior, broadly open, and nearly circular, without any adjacent membrane, the edges rounded. Legs stout. Tarsus equal to middle toe without claw; the joint feathered; lateral toes about equal; the basal joint of the middle toe half free internally, rather less so externally. Claws strong, much curved

The preceding diagnosis is intended to characterize two groups of Swallows, differing especially from all others in their thickened form, robustness of bill and feet, and especially in the elongated, comparatively powerful bill, the upper jaw decurved, its commissural edge much sinuated from the base, instead of as in all the others—being nearly straight to near the tip—so that a line from angle of mouth to tip will include the whole lower jaw. With these characters in common, there are two well-marked subgenera, recognizable as follows:—

PROGNE. Plumage glossy black above. Tail deeply forked, the lateral feathers much and gradually pointed. Bill most robust; upper outline convex from base. Tarsus with a few feathers only at base, on inner face.

PHŒOPROGNE. Plumage dull mouse brown above. Tail emarginate, or but slightly forked; the lateral feathers very abruptly pointed, and rounded. Bill weaker and more depressed; upper outline straight to near the tip. Tarsus with a line of feathers along inner edge for two-thirds the length from base.

a. PROGNE, Boie.

Bill notched, robust, and deep; the commissure much sinuated, convex, and ascending to the nostrils, then concave to the tip. Maxilla convex above from base; lower mandible slightly convex below, much more so above. Frontal feathers with a few bristles at base; none appreciable in chin. The upper joint of tarsus covered with feathers slightly adherent along inner face above, but not extending along the groove. Scutellæ distinct. Lateral toes about equal, reaching to base of middle claw; all the claws very strong, and much curved. Tail much forked; the feathers much pointed; the wings pointed, reaching beyond tip of tail. Plumage compact; glossy black above, with purple, violet, or blue reflection. Below either similarly colored, or with white belly and crissum.

I have found it very difficult to come to any definite conclusion in reference to the species of *Progne* inhabiting the continent of America, or to determine with accuracy their geographical distribution, notwithstanding the large number of specimens examined, including those in the Phila. Acad. of Nat. Sciences. This is due, in great measure, to the variation of plumage with age and sex—the young birds of one species representing the adult plumage of another—and

the size varying with the latitude. The absence of indications of sex, of date, and even of locality, too, tends to confuse very much all efforts at identification.

All the species of true *Progne* are lustrous black above, with blue, purple, or violet reflections. Several species are of this color all over, differing among each other in size, proportions, and shape of tail, etc. Others have white bellies and crissum, with the throat and jugulum either like the back, or brown.

I am quite satisfied that the impression as to the wide range of the North American Purple Martin (*P. subis*) is erroneous, at least during its breeding season. I have as yet seen no specimens from South America referable to this species, nor do I find any mention of it in the more recent lists of species of particular localities in that continent by Sclater and others. Closely related allies, however, exist, which will be elsewhere referred to.

The endeavor to identify the specimens before me has been greatly embarrassed by the absence of specimens unmistakably referable to the *Hirundo chalybea*, of Gmelin; this may be what I have called *leucogaster*, but it in no way agrees with the original description.

All the species of *Progne* exhibit very distinctly the patch of white on the side of the body, covered by the closed wing—apparently, indeed, characteristic of all the American *Hirundinidæ*.

Synopsis of Species.

Adult males entirely glossy blue-black all over.

Females and immature birds gray or light brownish below; the belly and crissum whitish, but more or less clouded with gray, especially in the central portion of the longer crissal feathers, the shafts generally dusky. (Perhaps especially applicable only to *subis*.)

Feathers about anus with a very small central portion pale whitish-gray. Wings and tail but slightly glossed. Fork of tail about .80 deep . . . *subis*.

Feathers about anus and of anterior part of crissum, with much of their central portion pure, concealed white. Belly of female perhaps much more white than in last. Wings and tail glossed almost like the back. Fork of tail about 1.00 deep . . . . . *cryptoleuca*.

Females and immature birds as in *P. subis*?

Feathers about anus and crissum dark brown in their concealed portion. Wings and tail dull, but slightly glossed. Fork of tail 1.10 deep . *furcata*.

Smallest of the group (length, 6.00; wing, 5¼). Tail less forked than in *subis* . . . . *concolor.*

Females and immature males beneath of a uniform brown or grayish-brown, the edges of the feathers paler . *elegans.*

Adult males glossy blue-black, except belly and crissum, which are snow-white.

Females and immature males with the black of under parts replaced by brown. Shafts of the white feathers white . . . . . *dominicensis.*

Adult males glossy blue-black above; dull brown or grayish-brown beneath (?); belly and crissum white.

Females and immature males with the shafts of longer crissal, and, to some extent, of ventral feathers dusky.

No blue-black patch on each side the breast? Adult male about 6.50 inches long. Wing about 5.00 . . . . . *leucogaster.*

A blue-black patch each side the breast? Adult male about 8.00 long. Wing about 5.50 . *domestica.*

Progne subis.

Hirundo subis, LINN. S. N. 10th ed. 1758, 192 (*Hirundo cærulea canadensis*, EDWARDS, Av. tab. 120, Hudson's Bay).

H. purpurea, LINN. S. N. 12th ed. 1766, 344 (*H. purpurea*, CATESBY, Car. tab. 51).—AUD. Orn. Biog. I, pl. xxiii.—IB. B. A. I, pl. xlv.—MAX. Cab. Jour. 1858, 101.—YARRELL, Br. Birds, II, 232*, 274 (England and Ireland, Sept. 1842).—JONES, Nat. Bermuda, 34 (Sept. 22, 1849).—*Progne purpurea*, BOIE, Isis, 1826, 971.—BREWER, N. Am. Ool. I, 1857, 103, pl. iv, fig. 47 (eggs).—BAIRD, Birds N. Am. 1858, 314.—SCLATER, Catal. 1861, 38.—COOPER & SUCKLEY, P. R. R. Rep. XII, 2, 186 (Fort Steilacoom).—BLAKISTON, Ibis, 1863, 65 (Saskatchewan).

Hirundo violacea, GM. I, 1026.

H. cærulea, VIEILL. Ois. Am. Sept. I, 1807, 57, pl. xxvi.

H. versicolor, VIEILL. Nouv. Dict. XIV, 1817, 509 (U. S.).

H. ludoviciana, CUV. R. A. I, 1817, 374.

Hab. The whole United States and the Provinces: Saskatchewan; Cape St. Lucas and northern Mexico (winter). Accidental in England.

(No. 1,561, ♂.) Entirely lustrous steel blue, with a purplish gloss; the tail feathers and the wings except the lesser and middle coverts, and edge inside, dull black, scarcely glossed. Tibiæ dark brownish. A concealed patch of white on the sides under the wings. Concealed central portion of anal feathers light whitish-gray.

(No. 1,129, ♀.) Above somewhat similar, but much duller. Beneath smoky brownish-gray, without lustre; paler behind, and becoming sometimes quite whitish on belly and crissum, but all the feathers always with dusky shafts, and more or less clouded with gray centrally, even though fading into

whitish to the edges. This is particularly appreciable in the longer crissal feathers. The edges of the dark feathers of throat and jugulum are usually paler, imparting somewhat of a lunulated appearance, their centres sometimes considerably darker, causing an appearance of obsolete spots. There is a tendency to a grayish collar on sides of neck, and generally traceable to the nape; this, in one specimen (5,492) from California, being hoary gray, the forehead similar.

The young male of the second year is similar to the female, with the steel blue appearing in patches.

Total length (of 1,561), 7.50; wing, 6.00; tail, 3.40; difference between inner and outer feather, .75; difference between 1st and 9th quills, 2.88; length of bill from forehead, .55, from nostril, .34; along gape, .94; width of gape, .74; tarsus, .61; middle toe and claw, .80; claw alone, .25; hind toe and claw, .54; claw alone, .27.

As already stated, I have been unable to satisfy myself as to the correctness of authors in giving a very wide range to our Purple Martin. Although Audubon mentions that the species leaves the United States in autumn and returns in the spring, I can find no indication in the more recent lists of species by Sclater, Salvin, and others, of its occurrence in any part of Mexico, Central America, or Andean South America. It is quoted from Brazil, but no one has identified it in any part of the West Indies, the only assigned locality—Cuba—being occupied by quite another and a different species (*P. cryptoleuca*). If, therefore, found in South America at all, it must make a long flight across the Caribbean Sea, without stopping by the way. In any case I am inclined to believe that the supposed specimens of this bird breeding in South America belong to allied species, and if a visitor at all, the present bird is only as a winter migrant.

In a foot-note[1] I give the description of certain specimens from

[1] **Progne elegans.**

Progne elegans, BAIRD, n. s.

?*Progne purpurea*, DARWIN, Birds of Beagle, 38 (Monte Video (November); Bahia Blanca, Buenos Ayres (September), breeding in holes in an earth cliff).

Hab. Buenos Ayres? Vermejo River; Brazil.(?)

Adult, steel blue all over.

(Young male, No. 21,009.) Above of a blackish-bronze color, with metallic lustre; beneath uniform dull dark brown, all the feathers edged or squamulated with paler. A few steel blue feathers in different parts of the body show that the adult male is entirely steel blue.

Another specimen, marked female,(?) has the edges of the feathers still lighter, those of the crissal feathers nearly white. The steel blue feathers are in greater number. A third, also marked female, and probably of that sex,

the Vermejo River, Paraguay, which may belong to the species usually considered as the resident "*P. purpurea*" of South America, but belonging clearly to a different and apparently unnamed species.

Specimens are in the collection from the entire United States

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is similarly marked below; dark brown above, with only faint metallic gloss towards the ends of the feathers, all the feathers narrowly margined with light grayish.

(No. 21,009, Paraguay.) Total length, 7.50; wing, 5.40; tail, 3.40; depth of fork, .84; distance between 1st and 9th primary, 2.36; length of bill from forehead, .52, from nostril, .32, along gape, .87, width, .62; tarsus, .57; middle toe and claw, .85; claw alone, .26; hind toe and claw, .54; claw alone, .27.

A specimen in Mr. Lawrence's collection, from Bahia (No. 146), and probably of this species, has nearly attained its full plumage. The color is a steel blue, with less purple than in *P. subis*, except about the head and neck, the lower part of the back showing a good many of the blackish-bronze feathers just described. The feathers of the under parts posteriorly, although steel blue, have yet a very narrow border of dull gray. The tibial feathers are gray at base, tipped with whitish, and there is a good deal of concealed white in the middle of the feathers of the anal region, less, however, than in the Cuban species. As in that bird there is also more lustre on the quills and tail feathers than in *subis;* but, owing to these being in moult, I cannot make any comparison of proportions.

The great difference in the coloration of the young bird distinguishes this species very satisfactorily from the *P. subis*, in which, as far as the examination of many specimens goes, the under parts are never of that peculiar uniform dark brown just described. Of this stage of plumage, so marked in the three specimens from the Vermejo, and in a specimen belonging to the Philadelphia Academy, I find no mention by authors.

It is very probable that this is the species usually considered as the *P. subis* (*purpurea*), of South America. That this is not the fact is easily shown by the difference in size and proportion, as well as in the coloration of the young birds. It cannot be *chalybea*, even if this, when adult, be entirely blue, as it is much larger than as described by Buffon and Brisson, and is dark fuscous brown beneath, and neither reddish-gray nor grayish-brown. It of course is none of the white-bellied species, and as far as I can see, lacks a name.

The "*Progne purpurea*," which Darwin found breeding at Bahia Blanca, Buenos Ayres, in holes excavated in the earth, probably belongs to this species. This habit I have not heard mentioned in reference to the North American bird.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,009	32	♂	Vermejo River.	Feb. 1860.	Capt. T. J. Page. Paraná Expl.	Chr. Wood.
21,010	32	♀	"	"	"	"
21,011	32	♀	"	"	"	"

from Atlantic to Pacific, as well as from Cape St. Lucas. Some special localities are as follows :—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,561	..	♂	Carlisle, Pa.	May 22, '44.	S. F. Baird.	.....
1,129	..	♀	"	July 18, '43.	"	.....
1,596	..	♂	"	June 5, '44.	.....	.....
5,204	..	♂	Mo. of Yellowstone.	July, 1856.	Lt. Warren.	Dr. Hayden.
5,492	607	♀	Petaluma, Cal.	April, 1856.	E. Samuels.	.....
5,493	576	♂	"	"	"	.....
5,049	..	♂	Indianola, Tex.	Mar. 12, '55.	Capt. J. Pope.	.....
3,952	231	♂	Coahuila, Mex.	May, 1853.	Lt. Couch.	.....
12,951	450	♂	Cape St. Lucas.	...	J. Xantus.	.....
26,448	3,339	♂	"	Nov. 5, '59.	" [U. S. A.	.....
37,003	549	♂	Fort Whipple, Ariz.	Aug. 11, '64.	Dr. E. Coues,	.....
11,611	..	..	Riceboro', Ga.	May 22, '49.	Jos. Leconte.	.....

(1,129.) 7.80; 16.50; 5.92. (1,596.) 8.16; 16.60; 6.00.

Progne cryptoleuca.

Progne cryptoleuca, BAIRD.

Hirundo purpurea, D'ORB, Sagra's Cuba, Ois. 1840, 94 (excl. syn.).—*Progne purpurea*, CAB. Jour. 1856, 3.—GUNDLACH, Cab. Jour. 1861.

Hab. Cuba, and Florida Keys? (Perhaps Bahamas.)

(No. 34,242, ♂.) Color much as in *P. subis*—rich steel blue, with purple or violet gloss; the wings and tail, however, much more decidedly glossed, and with a shade of greenish. The feathers around the anus and in the anterior portion of crissum with dark bluish down at base, pure snowy white in the middle, and then blackish, passing into the usual steel blue. The white is entirely concealed, and its amount and purity diminish as the feathers are more and more distant, until it fades into the usual gray median portion of the feather. The usual concealed white patch on the sides under the wings.

(No. 34,242.) Total length, 7.60; wing, 5.50; tail, 3.40; perpendicular depth of fork, .86; difference between 1st and 9th primary, 2.75; length of bill from forehead, .55, from nostril, .34; along gape, .86; width, .58; tarsus, .53; middle toe and claw, .79; claw alone, .24; hind toe and claw, .52; claw alone, .25.

This species has a close external resemblance to *P. subis*, for which it has usually been mistaken. It is of nearly the same size, but the feet are disproportionately smaller and weaker; while the wings are shorter, the tail is as long and more deeply forked; the feathers considerably narrower, and more attenuated (the outer .40 wide, instead of .46). The colors above are more brilliant, and extend more over the greater wing coverts and lining of wings, while the quills and tail feathers have a richer gloss of purplish, changing to greenish. An apparently good diagnostic feature is the concealed pure white of the feathers about the anal region, replaced in *subis* by grayish, rarely approximating to whitish.

This is a smaller species than the *Progne furcata*,[1] from Chile (9,112), with the tail, however, nearly as long and proportionately almost as much forked. It is much more richly colored, however; the concealed middle portion of the anal feathers white, not dark brown, etc. The feet are much smaller.

A *Progne* collected by Mr. Wright, at Monte Verde, is duller in color than that from Remedios, but has still more concealed white below, in the median portion, not only of the anal feathers, but of those of the entire crissum and of the belly. A female bird, which I presume to be the same species, can scarcely be distinguished from

[1] **Progne furcata.**

Progne furcata, BAIRD, n. s.

Hab. Chile (and other parts of western South America?).

(No. 9,112, ♂.) Color as in *P. subis*, with rather more of a purple gloss. Basal portion of the feathers in the anal region dark brownish, without trace of the whitish of *P. subis*. Tail deeply forked (for over an inch).

Measurements: Total length, 8.30; wing, 5.80; tail, 3.60; perpendicular depth of fork, 1.06; difference between primaries, 2.70; length of bill from forehead, .50, from nostril, .32; along gape, .90; width, .60; tarsus, .60; middle toe and claw, .90; claw alone, .25; hind toe and claw, .51; claw alone, .24.

This species is like *P. subis*, but differs appreciably from a large series of specimens in a considerably longer tail (3.60, instead of 3.40), and a much deeper fork (1.06, instead of .75.) The bill is considerably narrower than the average of *subis*, though not more so than in one specimen (4,773) from the upper Missouri. The concealed portion of the feathers about the anal region is much darker than in *subis*. The size, except of tail, is about the same.

This is probably the species to which Gray (Cat. Br. Mus.) refers as *P. modesta* (*concolor*), from Chile. The *P. concolor*, the synonyms of which I give below, is a very much smaller species, with the tail less forked than in *subis*, instead of much more so, and is probably peculiar to the Galapagos.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
9,112	4,095 / 2,613	♂ ad.	Chile.	..	Verreaux.	.....

Progne concolor.

Hirundo concolor, GOULD, P. Z. S. 1837, 22 (James Isl., Galapagos).

Progne modesta, GOULD, Birds Beagle, 39, pl. v. (Same specimen.)

Hab. Galapagos Islands.

Length, 6″; wings, 5¼; tail, 2¾; tarsus, ½; middle toe (without claw?), .35.

Less purple than *purpurea*. Tail less forked. Nostrils less; bill much the same. Feet much less strong.

the female of *dominicensis*, except in the brownish shafts of the longer crissal feathers, and an almost imperceptible tinge of brownish in the webs of the same feathers. It is almost exactly like the *P. leucogaster*, of Mexico and Central America.

A fuller series of specimens than is at present at my command will be required to determine all the relationships of this species to its allies.

A *Progne*, male (10,368), of the second year, from Cape Florida, I somewhat hesitatingly refer to the same species, as having the same proportions and dimensions. This is the specimen referred to in the Smithsonian Catalogue, and Birds N. Am. 923, as *Progne* ——.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
34,242	..	♂	Remedios, Cuba.	May, 1864.	N. H. Bishop.	Iris brown.
17,729	..	♂	Monte Verde, Cuba.	May 2.	Chas. Wright.	.....
17,730	..	♀	"	"	"	.....
†10,368	..	O.♂	Cape Florida, Fla.	May 18, '58.	G. Wurdemann.	7.50; 15.; 5.50.

Progne dominicensis.

Hirundo dominicensis, GM. S. N. I, 1788, 1025 (*Hirundo dominicensis*, BRISS. II, 493; BUFF. Pl. enl. 545, fig. 1).—VIEILL. Ois. Am. Sept. I, 1807, 59, pl. 28, 29 (St. Domingo).—? JARDINE, Ann. Mag. XVIII, 1846, 120, Tobago (breeds).—TAYLOR, Ibis, 1864, 166 (Porto Rico). —*Progne dominicensis*, MARCH, Pr. A. N. Sc. 1863, 295 (nesting).—GOSSE, Birds Jam. 69.

Hirundo albiventris, VIEILL. Nouv. Dict. XIV, 1817, 533 (St. Domingo?).

Hab. Jamaica, Porto Rico, and St. Domingo?

(No. 30,278, adult male, Jamaica.) General color lustrous steel blue, with purplish reflections; the median region only of the under parts, from the breast to and including crissum, pure white. Feathers of tibia gray at base, white at tip. Wings and tail blackish above, scarcely glossed, except on lesser and middle coverts. A concealed white streak in the sides, hidden by the wing—this color at the base of the feathers, and not extending to the ends. Bill black; feet dusky, perhaps dark flesh-color in life. "Iris hazel" (*Gosse*).

(No. 26,815, female.) Much duller in plumage. Above dark brown, or smoky brown, glossed with dull steel blue; the quills, rectrices and head brown, almost without gloss. Sides of head neck and body, chin, throat, jugulum, and inside of wings dull wood brown, without gloss; the median line of chin and throat rather paler; rest of under parts white, as in male, and quite abruptly defined; tibia gray, the feathers tipped with whitish.

The young male is like the female, with more steel blue on the head, the throat with blue feathers interspersed. Very young birds are like the female, and exhibit the same quite abruptly defined white below, with well marked

paler streak on throat. In all stages of plumage the feathers of crissum are snowy white to their roots, including the shafts.

(No. 30,278.) Total length, 7.00; wing, 5.60; tail, 3.15; difference between outer and inner feather, .78; difference between 1st and 9th primary, 2.88; length of bill from forehead, .55, from nostril, .34, along gape, .88; width of gape, .68; tarsus, .55; middle toe and claw, .78; claw alone, .26; hind toe and claw, .48; claw alone, .23.

The pure white of the belly and crissum, in all stages, will readily distinguish females and young of this species from those of *subis*, in which the white is not pure, and the feathers of the crissum always clouded with gray in the centres. The adult male is of course readily distinguished by the snowy white belly, etc.

In size the two birds are not materially different—the *dominicensis* rather the smaller. The tail feathers appear disproportionately narrower and more attenuated—the outer being .40 of an inch wide, instead of .48. The feet, too, are disproportionately smaller, the hind toe and claw especially, which measure .48, instead of .54.

I cannot detect any difference between the Jamaica bird and a Porto Rican skin in Mr. Lawrence's collection, except that the latter has a patch of blackish on the outer web of the longest crissal feather. I am, however, by no means sure that the Cuban and Porto Rican birds, either or both, belong to the true *dominicensis*, of St. Domingo. They are, at any rate, very different from the species of continental Middle, or of South America, usually considered as identical.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,278	18	ad. ♂	Spanishtown, Jam.	May, 1863.	W. T. March.	.....
30,279	18	♀	"	"	"	.....
30,280	..	♀	"	July, 1863.	"	.....
26,815	..	♂?	"	July, 1862.	"	.....
24,378	..	♀.	"	July, 1861.	"	.....
..	145	♂ad.	Porto Rico.	...	Cab. Lawrence.	.....

Progne leucogaster.

Progne leucogaster, BAIRD.

Progne dominicensis, SCLATER, P. Z. S. 1857, 201 (Vera Cruz); 1859, 364 (Xalapa).—SCLATER & SALVIN, Ibis, 1859, 13 (Guatemala).—SALV. Ibis, 1859, 466 (Belize).—TAYLOR, Ibis, 1860, 110 (Honduras).

Progne chalybea, CABANIS, Jour. 1860, 402, (San Jose, Costa Rica; July) (not *H. chal.* of GMELIN ?).—LAWRENCE, Ann. N. Y. Lyc. 1861, 318 (Panama R. R.).—CASSIN, Pr. A. N. Sc. 1860, 133 (Carthagena).

Hab. From Southern Mexico to Isthmus of Darien, and Carthagena. (N. eastern South America ?)

(No. 30,718, ♂.) Upper parts glossy steel blue, as in *P. subis;* the quills, greater coverts, and tail feathers blackish, scarcely glossed, with the color of

the back; chin, throat, jugulum, and sides of head (below the centre of teh eye) neck and body, with inside of wings, grayish-brown, without gloss or lustre (as in *Cotyle riparia*), rather lighter along the median line. Rest of under parts dull white, not very sharply defined, passing behind into pure white on the anal region and crissum—the latter having the shafts of the longer feathers dusky, in contrast with the snowy white of the plume. A concealed white stripe on the sides under the wings, as in other *Progne*. Tibia gray, the feathers tipped with whitish.

The female (30,717) is quite similar, with much less gloss above, the white of the belly apparently passing further forward, and still less sharply defined; the throat a little lighter.

(No. 30,718, ♂, Guatemala.) Total length, 6.30; wing, 5.10; tail, 2.70; perpendicular depth of fork, .53; difference between 1st and 9th primary, 2.55; length of bill from forehead, .50, from nostril, .28, along gape, .84; width of gape, .62; tarsus, .49; middle toe and claw, .73; claw alone, .23; hind toe and claw, .46; claw alone, .22.

This Mexican and Central American species has generally been considered to be identical with the West Indian *P. dominicensis*, but a comparison of large series of specimens shows considerable differences. It is decidedly smaller, and the depth of fork of tail only two-thirds as great. As to color, none of the specimens before me exhibit any trace, on the under surface of the body, of the glossy steel blue of the back, found in males of *dominicensis;* in this respect resembling females and immature males of the latter species. From these, however, it may be distinguished by smaller size—even in the males—and by having the shafts of the longer crissal feathers dusky, instead of being pure white. The white of the belly is less abruptly defined against the gray of the breast (which is darker also), and apparently occupies a wider space.

The male bird (No. 30,718), the measurements of which I have given, appears to have a disproportionately short foot. In No. 30,717, supposed female, from Dueñas, the dimensions of the leg are as follows: Tarsus, .56; middle toe and claw, .81; claw alone, .27; hind toe and claw, .51; claw alone, .26, or nearly the size of *P. subis* with longer middle toe and claw. Other specimens are intermediate somewhat in this respect. It may be that the differences indicate a second species, but I cannot define it from the materials at my command. The only other difference I note is a greener or less purple gloss to the back.

It is barely possible that fully adult males of this species may have steel blue throats, as in true *dominicensis*, although I find no allusion to the fact in any description. Even in this case, however, the smaller size, less deeply forked tail, and dusky shafts of the longer crissal feathers will distinguish them.

So far as I can ascertain, this species has never received a distinctive appellation. Specimens from Panama, apparently identical, have been labelled *P. chalybea*, by Mr. Cassin and Mr. Lawrence; but as explained below,[1] I cannot agree with their conclusions, or those of Cabanis.

There are in the collection specimens of a closely allied, though larger species, from Bolivia, which I have referred to the *P. domestica*, named from Azara.[2]

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[1] **Progne chalybea.**

Hirundo chalybea, GMELIN, S. N. I, 1788, 1026 (*Hirundo cayanensis*, BRISSON, II, 495, tab. 46, fig. 1; BUFF. VI, 675; Pl. enl. 545, fig. 2, Cayenne).

Hab. Cayenne.

Of this species I have never seen a specimen, or one agreeing unmistakably with the minute account of the above mentioned authors.

As described by Brisson (L'Hirondelle de Cayenne), it is steel black above, with the *entire under parts* grayish-brown. The lateral tail feather exceeds the middle by six lines. Length, 6 inches; bill, 9½ lines; tarsus, 5 lines; middle toe and claw, 7 lines. Buffon speaks of it as lustrous violet black above, *beneath reddish-gray*, veined with brown; lighter on the lower parts of belly and crissum. Length, 6 inches; bill, 9½ lines; tarsus, 5 or 6 lines, etc. The size is thus much as in Brisson's bird; the lower parts reddish-gray, varied with brown, paler behind, instead of grayish-brown. Neither author refers to any white whatever on under parts. In size the species agrees better with *P. leucogaster* than any other true *Progne*, and it is barely possible the two may be the same, but I cannot reconcile the apparent differences. It would, at any rate, be strictly in accordance with the usual law of distribution of South American birds to find the Cayenne species specifically different from the Central American.

[2] **Progne domestica.**

Hirundo domestica, VIEILL. Nouv. Dict. XIV, 1817, 521 (*Golondrina domestica*, D'AZARA, Apunt. II, 1805, 502, no. 300, Paraguay).—VIEILL. Encycl. Méth. II, 1823, 527.—?*Progne domestica*, GRAY, Genera.—IB. Catal. Fiss. Br. Mus. 1848, 28 (Bolivia).—CABANIS, Mus. Hein. I, 1850–1, 51 (Rio Grande do Sul).—BURMEISTER, Ueb. III, 142.—IB. Reise La Plata, II, 1861, 477 (La Plata).

Hab. Paraguay and Bolivia.

(No. 16,834, young male, Bolivia.) Above steel blue, much as in *P. subis*. Beneath, from chin to breast, and on sides, smoky brown. Rest of under parts white, the shafts mostly dusky. Feathers tipped with steel blue, forming as a kind of collar across the jugulum and along the sides of body; no trace of them on the chin, throat, and abdominal region, not even in the pin feathers.

A second specimen, also probably young male, is still lighter on the throat and breast, almost white on the latter, although clouded with brown, and with

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
29,704	..	..	San Andres, near Vera Cruz.	June 1856.	A. Sallé.	.....
12,865	..	♀	Tehuantepec.	...	T. C. Martin.	A. J. Grayson.
30,718	363	♂	Cahabon, Vera Paz.	Mar. 1862.	O. Salvin.	Salv. & Godman.
30,717	4,480	..	Dueñas, Guat.	Oct. 1861.	"	"
29,431	..	♀	Acajutla, Salv.	Mar. 11, '63.	Capt. J. M. Dow.	.....
29,432	..	♂	"	"	"	.....
33,288	146	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
17,791?	..	..	Carthagena, N. G.	...	Lt. Michler.	A. Schott.
.. ?	143	♂	Panama R. R.	...	Cab. Lawrence.	M'Lean. & Galb.
.. ?	144	♀	"	...	"	"

PHÆOPROGNE, Baird.

Similar to *Progne;* the bill and legs weaker. Tail slightly forked, the lateral feathers not attenuated, and the wing not reaching beyond its tip. Plumage without the metallic lustre of true *Progne*. A narrow line of feathers attached along basal half or two-thirds of the inner side of tarsus.

The species of this group have been assigned by authors both to *Progne* and *Cotyle*, but differ in some respects from both. To

scattered blue-tipped feathers. A third, perhaps female, has no blue feathers beneath.

It is difficult to say what may be the color of the under parts in the adult male bird. It seems as if a jugular or pectoral collar and the sides of body might be steel blue, the chin and throat smoky brown, and the belly and crissum white, with more or less concealed dusky shafts to the feathers. Nothing like this, in adult plumage, however, is described or known.

Closely allied to the *P. leucogaster*, this species differs in considerably larger size; paler, almost whitish chin and throat, tendency to steel blue on the sides of breast and sides of body, etc.

(No. 16,834.) Total length, 7.70 · wing, 5.40; tail, 3.20; depth of fork, .70; difference between 1st and 9th primary, 2.50; length of bill from forehead, .49, from nostril, .34; along gape, .90; width, .60; tarsus, .58; middle toe and claw, .84; claw alone, .26; hind toe and claw, .50; claw alone, .25.

This is probably the same species as that referred to by Gray as *P. domestica;* but without specimens from Paraguay, for comparison, I am unable to say whether it is the true "*domestica*," as based upon a description by Azara. Burmeister (Reise La Plata, II, 477), in saying that the adult of *domestica*, from Paraguay, is entirely steel blue, has possibly confounded with it the *P. elegans*, described on a previous page. I see no reason to believe that the white belly and crissum are ever wanting.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,834	..	..	Bolivia.	...	Walter Evans.	.....
16,836	..	..	"	...	"	.....
16,839	..	..	"	...	"	.....

Cotyle, however, the relationship, except in coloration, is very slight, as the nostrils are superior, without overhanging membrane as in *Cotyle*; the lower end of tarsus destitute of feathers (the upper, on the contrary, being provided with them); the lateral claws short, much curved, and not reaching beyond the base of the middle. The bill is much stouter, and the body more robust; the edge of wing without hooks, in these respects differing from *Stelgidopteryx*.

With somewhat the fulness of form of *Progne*, the bill resembles the latter in having the nostrils superior, exposed, and without overhanging membrane. The frontal feathers are soft, but with short bristles lining the base of the upper jaw, and a few on the side of the lower, but none in the chin. The bill is more depressed than in *Progne*, but similarly shaped; the lower edge of the upper mandible much sinuated, or quite convex to the anterior extremity of the nostril, and then passing into an equally concave curve to the tip. Both jaws are more depressed, and their upper outlines less convex, especially towards the base, than in *Progne*. The feet are weaker, but the adhesion of the toes much as in *Progne*—the basal joint of the median being free for about half internally, a little less externally. The upper joint of the tarsus is covered with feathers, which are attached along the inner edge in a narrow line for half the length, or more than half the length (even three-fourths). This feature is quite peculiar to *Phæoprogne*, not existing at all in *Progne*, nor to anything like the same extent in any other American Swallows. The tarsal scutellæ are so much fused as to be almost undistinguishable. The wings are more falcate, the feathers broader and less curved than in *Progne*; the tail but slightly forked; the lateral feathers without the gradual attenuation of *Progne*.

The species of this group belong strictly to South America, but are not well determined. I give below the two which seem to be contained in the specimens which I have examined. None have any metallic gloss, as in *Progne*—resembling in color *Cotyle* and *Stelgidopteryx* more than any other genera. The form is more that of *Petrochelidon*, the nostrils being equally superior and uncovered, and the tail is somewhat similar. The bill is, however, much stouter, longer, and the commissure is sinuated, not nearly straight.

Synopsis of Species.

COMMON CHARACTERS.—Above and along sides dull smoky brown, without metallic lustre; a fainter pectoral band of the same. Rest of under parts white.

Sides of neck white, passing around on the nape into a narrow

hoary collar. Epigastrium with a median line of rounded brown spots . . . . . *fusca.*[1]

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[1] **Progne fusca.**

Hirundo fusca, VIEILL. Nouv. Dict. XIV, 1817, 510.—IB. Encycl. Méth. II, 529 (based on *Golondrina de la parda*, AZARA, Apunt. II, 1805, 505, no. 301, Paraguay).—*Progne fusca*, CAB. Mus. Hein. I, 1850–1 (not of Gray?).

Hab. Region of the Parana.

(No. 12,042, ♂.) In coloration and markings an almost exact reproduction of *Cotyle riparia*, although much larger. Above rather light smoky brown, without metallic lustre; the rump not paler than the back; the quills and tail feathers considerably darker, their upper surfaces with a faint greenish gloss. All the smaller feathers above with paler edges. Beneath pure white; the sides of body and breast, lining of wings, tibiæ, and a pectoral band, brown like the back, the latter glossed with whitish. Feathers along median line of belly, from pectoral band almost to vent, with large, somewhat concealed rounded blotches of brown, especially on the inner webs. Side of the neck, with its lower half hoary white, this color extending round above so as to form a nuchal band, but narrower, and much obscured with brown. Feathers of crissum and chin, including their shaft, pure white from base. Bill and legs apparently dark brown.

The boundary between the white and brown on the side of head is in a line with the commissure, though even below this and on the side of lower jaw the feathers are tinged with brown. The smaller under wing coverts, and the feathers along the edge of the wing inside, are rather broadly margined with white.

(No. 16,341.) Total length, 6.50; wing, 4.85; tail, 3.00; depth of fork, .32; difference of primaries, 2.35; length of bill from forehead, .61, from nostril, .34; along gape, .85; tarsus, .54: middle toe and claw, .75; claw alone, .25; hind toe and claw, .50; claw alone, .24.

The specimens here described, from Capt. Page's collection, are labelled "Brazils," but were probably taken on the Parana River, in the interior of the country, and in the region of Azara's species. It is, however, possible that the species may be the *tapera*, as restricted by authors, and the bird I have considered as *tapera*, true *fusca*, if not an unnamed species.

A specimen from the Vermejo (21,012) differs in lacking almost entirely the paler edges of the feathers of upper parts, and in having the sides of the neck much less hoary. The inside of the wing is less varied with white.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,341	120	♀	Brazil.	Oct. 1859.	Capt. Page, Expl.	Chr. Wood.
16,343	120	♀	"	"	" [Parana R.	.....
12,042	120	♂	"	"	"	.....
?21,012	38	♀	Vermejo River.	Feb. 1860.	"	.....

Sides of neck and nape brown, like the back, or the former only slightly hoary. No distinct spots along the middle of epigastrium . . . . . *tapera*.[1]

PETROCHELIDON, CABANIS.

Petrochelidon, CAB. Mus. Hein. 1850–1, 47. (Type *Hirundo melanogaster*, SWAINS. = *P. swainsoni*, SCL.)

Bill stout and deep, somewhat as in *Progne*. Nostrils entirely superior, open, without overhanging membrane on the inner (or upper) side, but somewhat overhung by short bristles, seen also along base of inner mandible and in chin. Legs stout; the tarsi short, not exceeding the middle toe exclusive of its claw; feathered all round for basal third or fourth, though no feathers are inserted on the posterior face. Tail falling short of the closed wings, nearly square, or slightly emarginate; the lateral feathers broad to near the ends, and not attenuated.

The claws of *Petrochelidon* are large, and considerably curved. In *pœciloma* there is a distinct, though short web connecting the

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[1] **Progne tapera.**

Hirundo tapera, LINN. S. N. 12th ed. 1766, 345, Brazil (*L'Hirondelle d'Amérique*, BRISSON, II, 502, tab. 45, fig. 3).—*Progne tapera*, CAB. Schomburgh's Reise Guiana, III, 672.—SCLATER, Catal. 1861.—*Cotyle tapera*, BURM. Uebers. III, 1857, 143 (Brazil).

?*Hirundo pascuum*, MAX. Beit. III, 1830, 360.

Hab. Brazil? Bolivia? Bogota?

Specimens in the museum of the Philadelphia Academy, supposed to belong to this species, though from Bolivia and Bogota, resemble *fusca* very closely, but differ in larger and more attenuated bill, shorter toes, and fewer feathers on tarsus. The size and color are much the same; but the sides of neck and nape lack the hoary white collar obscured behind, nor do I observe the line of elongated rounded, partially concealed large brown spots along the median line of the belly. The white of the under parts is not so pure.

Whether this be the same with the Brazilian *tapera*, of authors, I have not had the opportunity of determining, but would not be surprised to find that it was distinct. It is also quite possible that, in the absence of specimens actually from Paraguay, I have incorrectly identified Capt. Page's specimens as *fusca*, and that they are really *tapera*.

Total length, 6.60; wing, 5.30; tail, 2.85; depth of fork, .45; difference of primaries, 2.55; length of bill from forehead, .65, from nostril, .38; along gape, .88; tarsus, .54; middle toe and claw, .72; claw alone, 20; hind toe and claw, .48; claw alone, .22.

The *Hirundo americana tapera*, of Sloane (Jamaica, II, 212), the first reference quoted by Linnæus, cannot be the present species, as it refers to a Jamaican bird which Sloane compares with the European Swift; it may be either *Progne dominicensis* or *Chætura zonaris*, quite possibly the latter. It is, therefore, a question how far the name *tapera* can be retained for the species.

bases of the inner and middle toes. The lateral toes are nearly equal, the outer, if anything, slightly longer; the entire basal joint of the outer adherent to middle; the membrane just referred to extending along the basal joint of the inner. The basal joint of the middle is free externally at extreme end. The feathers of crissum are very full, and reach nearly to end of tail.

This is one of the most natural genera of American Swallows, embracing a considerable number of species, all characterized by the rufous rump. *H. nigricans*, Vieill. (*Collocalia arborea* of Gould), from Australia, appears to be strictly congeneric, as first suggested by Cabanis. The development of bristles in the chin and among the frontal feathers appears quite characteristic, giving a roughness to the forehead very different from the softness and smoothness of *Atticora* and other genera.

The diagnostic characters of the principal American species of *Petrochelidon* are as follows:—

COMMON CHARACTERS.—Above steel blue; the feathers of the interscapulum with concealed whitish edges; no whitish median or basal down. Rump and narrow nuchal band chestnut; crissum gray brown, tinged anteriorly at least with chestnut; the longer feathers and inner side of lateral tail feathers edged with whitish. Middle region of belly white. Usually with a whitish or reddish frontal band.

Chin and throat, with side of head, and continuous with nuchal band, chestnut brown.

Jugulum with large blue-black patch. Chestnut of throat darker than that of rump.

Frontlet reddish-white, with narrow band of black along upper mandible . . . . *lunifrons.*

Frontlet chestnut brown, without black at base of upper mandible . . . . *swainsoni.*

Jugulum plain, without black spot. Chestnut of throat lighter than that of rump. Frontlet chestnut brown.

Sides of body only slightly tinged with chestnut . . . . . *fulva*

Sides deep chestnut, continuous with that of breast and crissum. Size smaller . *pœciloma.*

Chin, throat, and sides of head white.

Fore part of breast chestnut, without black spot. Sides faintly tinged with same.

Frontal band obsolete . . . . . *ruficollaris.*

P. nigricans, of Australia, lacks the nuchal band; the sides of

head are blackish; the throat grayish-white; the breast pale chestnut, both with dusky shaft streaks. The chestnut of front and rump is quite pale.

Petrochelidon lunifrons.

Hirundo lunifrons, SAY, Long's Exp. II, 1823, 47 (Rocky Mts.).—CASSIN; BREWER, N. A. Ool. I, 1857, 94, pl. v, no. 68–73 (eggs).—BAIRD, Birds N. Am. 1858, 309.—LAWRENCE, Ann. N. Y. Lyc. 1861, 317 (Panama R. R.; winter).—VERRILL, Pr. Bost. N. H. Soc. 1864, 276 (migration and history).—LORD, Pr. R. A. Inst. Woolwich, IV, 1864, 16 (Br. Col.; nesting).—COOPER & SUCKLEY, P. R. R. XII, II, 184 (Wash. Terr.).

H. opifex, CLINTON, 1824.—*H. republicana*, AUD. 1824.

H. fulva, BON. (not of VIEILLOT).—AUD. Orn. Biog. I, pl. 58.—IB. B. A. I, pl. 47.—MAXIM. Cab. Jour. VI, 1858, 100.

Hab. Entire United States from Atlantic to Pacific, and along central region to Arctic Ocean and Fort Yukon; Panama, in winter. Not noted at Cape St. Lucas, in Mexico, or West Indies.

(No. 18,322, ♂.) Top of head glossy black, with greenish lustre; back and scapulars similar, but rather duller, and somewhat streaked by the appearance of the white sides of the feathers—the bases of the feathers, however, being plumbeous. Chin, throat, and sides of head chestnut brown, this extending round on the nape as a distinct continuous collar, which is bounded posteriorly by dull grayish; the chestnut darkest on the chin, with a rich purplish tinge. Rump above and on sides paler chestnut (sometimes fading into whitish). Upper tail coverts grayish-brown, edged with paler, lighter than the plain brown of the wings and tail. Forehead, for the length of the bill, creamy white, somewhat lunate, or extending in an acute angle a little over the eye; a very narrow blackish frontlet; loral region dusky to the bill. A patch of glossy black in the lower part of the breast, and a few black feathers in the extreme chin, the latter sometimes scarcely appreciable. Under parts dull white, tinged with reddish-gray on the sides and inside of the wings. Feathers of crissum brownish-gray, edged with whitish, with a tinge of rufous anteriorly (sometimes almost inappreciable).

(No. 18,322.) Total length, 5.10; wing, 4.50; tail, 2.40, nearly even; difference of primary quills, 2.10; length of bill from forehead, .38, from nostril, .25, along gape, .60, width, .50; tarsus, .48; middle toe and claw, .72, claw alone, .22; hind toe and claw, .44, claw alone, .20.

There is some variation in amount and shade of rufous in different specimens. Usually there is none on the sides of body, and very little at the base of the crissum. The rufous of the rump is always lighter than that of the throat, where this color extends down on the jugulum, with indistinct rounded outline behind, shading into the smoky, reddish-gray of the sides of the breast.

As in its allies, immaturity is shown longest in the absence or

dulness of the frontal band. There is no appreciable difference in the sexes.

A specimen in Mr. Lawrence's collection, from Panama, I cannot distinguish, except in being smaller. Length, 4.80; wing, 4.10; tail, 2.10. The forehead is nearly white, as usual in *lunifrons*.[1]

Summer specimens from the southern Rocky Mts. (Los Pinos, N. M.) and Carlisle are considerably smaller than those from Fort Bridger.

Specimens in the collection from throughout the whole United States to northern border, as also—

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[1] **Petrochelidon ———.**

?Hirundo americana, GMELIN, S. N. I, 1788, 1017 (from Buffon, VI, 698, La Plata).—*Petrochelidon americana*, CAB. Mus. Hein. 1850–1, 47.

?Hirundo pyrrhonota, VIEILL. Encycl. Méth. II, 524 (AZARA, Apunt. II, 511, no. 305, Paraguay).—*Cotyle p.* BURM. Reise La Plata, II, 1861, 477 (Tucuman).

Hab. Brazil? Paraguay?

In Mr. Lawrence's collection is an immature bird (No. 148, from Brazil), much like corresponding stages of *P. lunifrons*, but differing in considerably smaller bill, and in the lower tail coverts being much shorter (falling three-quarters of an inch short of the tip). The rufous of the rump extends further up the back, and there is a decided wash of reddish over the breast and belly, sides and crissum, leaving only the abdominal region pure white. The frontal band is not fully developed, but seems as if it might be whitish; there is a blackish spot on the lower throat, and a few whitish feathers in the chin. The chestnut of the throat is lighter than in *lunifrons*, or of about the same shade as that of rump. I think there is no doubt of its being quite distinct from *lunifrons* or *swainsoni*, but in its still immature condition cannot venture to identify it. There are two names to which it might be referred, the *H. americana*, of Gmelin—*P. americana*, Cab. M. Hein. I, 47—(based on *Hirondelle a croupion roux*, etc. (from the La Plata), BUFFON, Ois. VI, 698, La Plata)—which, however, appears much too large—and *Hirundo pyrrhonota*, VIEILL. Encycl. II, 524; Azara, Apunt. II, 511, Sonnine ed. 104; *Cotyle pyrrhonota*, Burm. La Plata, II, 477. This is described by Azara as having black crissum; Burmeister, however, says this is grayish, edged with rusty whitish; the forehead, lores, cheeks, and rump rusty brownish-red; fore-neck, breast, and belly ash gray, washed with yellowish, and tinged with reddish about the anus. Length, 5″. Wings, 4″.

Buffon speaking of his *Hirondelle a croupion roux et queue carrée*, describes it as brownish-black above, with green and blue reflections; rump rufous, the feathers edged with whitish; under parts dull white, the lower tail coverts rufous. Another specimen is said to have a rufous throat. No mention is made of a black spot on the jugulum, or of a frontal band.

Smithsonian No.	Collector's No.	Sex and Age	Locality.	When Collected.	Received from	Collected by
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			
[illegible]			[illegible]			

[illegible]

Petrochelidon swainsoni.

Hirundo melanogaster. Swainson, Phil. Mag. I. 1827, 366 (Mexico).—*Petrochelidon melanogaster*, Cab. Mus. Hein. I. 1850, 47.

Petrochelidon swainsoni. Sclater, P. Z. S. 1855, 296; 1859, 376.—Id. Catal. 1861, 40, no. 244. (Swainson's name changed as inappropriate.)

Hab. Highlands of Mexico.

This species is almost precisely like *P. lunifrons*, but is smaller, and the frontlet, instead of being creamy or rosy white, is chestnut brown like the throat; the lores are less dusky, and there is no dusky at base of upper mandible. In these respects it resembles *P. fulva*, but will be readily distinguished by the large glossy black spot on the throat, and blackish chin, as well as comparative absence of reddish on crissum and sides.

Two specimens, both marked males, differ considerably in size, as shown by the following measurements. In one (22,376) the forehead is of the same shade of rufous as the throat, and the black spot on the throat very small; in the other, which is decidedly larger, the forehead is considerably paler than the throat, and the throat spot more distinct, the chestnut of throat and sides of head much darker.

(No. 22,376, ♂.) Total length, 4.50; wing, 3.90; tail, 2.25; difference of quills, 1.90; length of bill from forehead, .35, from nostril, .21, along gape, .55; tarsus, .48; middle toe and claw, .60, claw alone, .20; hind toe and claw, .37, claw alone, .19.

(No. 33,572.) Total length, 4.90; wing, 4.30; tail, 2.20; length of bill from forehead, .41, from nostril, .22, along gape, .60; tarsus, .53; middle toe and claw, .66, claw alone, .21; hind toe and claw, .38, claw alone, .21.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,376	40,745	♂	Mexico.	...	Verreaux	.....
33,572	136	..	Mirador, Mex.	Aug. 1863.	Dr. Sartorius.	.....

Petrochelidon fulva.

Hirundo fulva, VIEILL. Ois. Am. Sept. I, 1807, 62, pl. xxx (St. Domingo).—IB. Nouv. Dict. XIV, 1817, 521.—IB. Encyc. Méth. II, 1823, 526.—*Petrochelidon fulva*, CAB. Mus. Hein. 1850, 47.—IB. Jour. Orn. IV, 1856, 3 (Cuba).

Hirundo coronata, LEMBEYE, Aves de Cuba, 1850, 45.

Hab. Cuba and St. Domingo?

(No. 34,238, ♀.) Top of head, back, and scapulars steel blue, with a greenish gloss, more violet in some specimens. Forehead from the eyes (not strictly defined), nuchal bands and rump (but not tail coverts), dark chestnut brown; chin, throat, sides of breast and crissum, especially near anus, lighter chestnut brown; the sides of body and inside of wings smoky brown, tinged with the color just mentioned; median region of the body white. No blackish on the breast or on forehead. Wings and tail with their upper coverts lustrous brown. A dusky spot in the loral region.

(No. 34,238, ♀.) Total length, 5.00; wing, 4.20; tail, 2.10; perpendicular depth of fork, .15; difference between 1st and 9th quills, 2.00; length of bill from forehead, .36, from nostril, .21, along gape, .56, width, .45; tarsus, .47; middle toe and claw, .65, claw alone, .19; hind toe and claw, .37, claw alone, .20.

The feathers of the back have a white patch on each side the shaft, about the middle, causing white streaks when visible among the feathers. The forehead and rump are quite dark chestnut; the chin and throat, with crissum just behind anus, come next in shade, this color fading still more on jugulum and sides (the jugulum sometimes darker than chin), and scarcely appreciable posteriorly on the side of the abdomen. The longer feathers of crissum are dark brown, with reddish-white edges, much paler than near the vent. The white of the belly is sometimes glossed faintly with chestnut, especially along the shafts of the feathers. The axillars and lining of wings, with tibia, are of a smoky gray, with a rufous tinge. The chestnut nape is narrow, and sometimes quite obsolete; the color of the neck behind it is dull and lustreless. The dark chestnut of the rump extends round on the sides as well as above, continuous with the paler tinge of the anterior portion of the crissum. The inner web of the lateral tail feather is edged with whitish near the end.

There is no black band along base of upper mandible, as in *lunifrons*. The chestnut feathers of the front exhibit a tendency to dusky centres, except near the bill, a feature not noticed in other species.

This bird is much smaller than the North American *lunifrons*, and differs in the rufous chestnut (not whitish) front, the absence of black patch on throat, much lighter rufous of the throat (paler

considerably than the front), etc. The tarsi are longer in proportion, being absolutely of the same length, while the feet are much weaker and the toes shorter.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,238	..	♀	Remedios, Cuba.	April 4. '64.	N. H. Bishop.	.....
34,236	..	♂	"	May, 1563.	"	.....
34,190	..	..	Cuba.	...	Dr. J. Gundlach.	.....
34,491	..	..	"	...	"	.....
..	154	..	"	...	Cab. Lawrence.	.....

Petrochelidon pœciloma.

Hirundo pœciloma, Gosse, Birds Jamaica, 1847, 64.

Petrochelidon fulva, Sclater, P. Z. S. 1861. 72.—Ib. Catal. 1861, 40, no. 245 (Jamaica).—*Hirundo fulva*, March, Pr. A. N. Sc. 1863, 295 (nesting).

Hab. Jamaica.

Similar to preceding, but smaller; chestnut color darker. Chestnut of sides very decided, and continuous with that on breast and crissum.

(No. 24,381.) Total length, 4.50; wing, 4.15; tail, 2.05; fork, .10; difference between 1st and 9th quills, 1.95; length of bill from forehead, .35, from nostril, .20, along gape, .55; tarsus, .48; middle toe and claw, .64; hind toe and claw, .38.

A series of specimens from Jamaica differs from Cuban in being rather smaller in size, and in having the chestnut brown of the under parts considerably deeper and more marked, extending along the sides of the body so as to be continuous with that of the sides of the rump. The chestnut nuchal collar, also, is more distinct. A young bird from Jamaica differs from the adult in lacking the frontal band almost entirely, and in having a whitish chin. I have not had an opportunity of examining the St. Domingan species, but would not be surprised if it proved different from those of Cuba and Jamaica.

A closely allied species is the *P. ruficollaris*, of Peale.[1]

[1] **Petrochelidon ruficollaris.**

Hirundo ruficollaris, Peale, Mammals and Birds U. S. Expl. Exped. 1848, 175.

Hab. Peru.

Head above and back glossy blue-black. Rump above and on sides, fore part of the breast, and sides of body beneath the wings, chestnut, as also an indistinct nuchal half collar. Chin, throat, sides of head below the eyes, and rest of under parts, white; the crissum tinged with rufous anteriorly, the long feathers grayish-brown, edged with whitish. Wings and tail dull brown, the

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
24,381	16	♂	Spanishtown, Jam.	Dec. 1861.	W. T. March.	.....
24,382	16	♂	"	"	"	.....
24,383	16	♀	"	"	"	.....
24,384	..	♀	"	"	"	.....
30,281	..	Ó.	"	1863.	"	.....
30,282	..	..	"	"	"	.....
30,283	..	..	"	"	"	.....

HIRUNDO, LINN.

Hirundo, LINN. Syst. Nat. I, 10th ed. 1758, 191. (Type *H. rustica*, LINN.)

Under the generic head of *Hirundo* I propose to combine several groups of American Swallows agreeing in moderate, depressed bill, with straight commissure, and lateral nostrils overhung by membrane; the tarsi feathered only at the upper end, or else entirely bare; the lateral claws moderate, not extending beyond the base of the median; the edge of the outer primary without hooks; the tail variable in character, from a very deep fork to a slight emargination only. The relationships to the other genera have already been expressed in the diagnosis presented in the beginning of the article on the family.

The following characters express the peculiarities of the different sections or subgenera of *Hirundo*:—

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latter with lateral feathers edged internally near end with whitish. Forehead without frontal band, other than an almost inappreciable gloss of chestnut.

Total length, 4.55; wing, 4.00; tail, 2.15; difference between quills, 1.80; length of bill from forehead, .30, from nostril, .17, along gape, .54, width, .43. Feet mutilated.

The well-marked jugular or pectoral band, white throat and cheeks, and absence of distinct frontlet will readily distinguish this species from *lunifrons* and its allies. It may be that a more decided frontlet exists in more perfect plumage, although there is nothing to indicate that this has not been attained in the specimen.

This species appears to have been overlooked by all writers subsequent to Mr. Peale.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
14,999	C 377	♂	Callao, Peru.	July 12, '39.	U. S. Expl. Exped.	T. R. Peale.

(14,999.) Type. Irids brown.

Tarsi slightly feathered in front at upper end; equal in length to middle toe without claw.

Tail very deeply forked . . . . . *Hirundo*.

Tail slightly forked or emarginate . . . . . *Tachycineta*.

Tarsi entirely naked, emarginated; equal to middle toe and half its claw.

Tail considerably forked . . . . . *Callichelidon*.

HIRUNDO. Linn.

Generic characters. Tarsi short, not exceeding middle toe without its claw; the upper joint covered with feathers which extend a short distance along the inner face of tarsus. Tail very deeply forked; the lateral feathers much attenuated, twice as long as the middle. Basal joint of middle toe free for terminal fourth on outside, for half on inside.

In type, and in American species, forehead and throat rufous; a black pectoral collar; tail feathers with large light spots on inner webs.

But two species, perhaps only one of this subgenus, as restricted, belong to America. There are, however, quite a number found in the old world.

Hirundo horreorum.

Hirundo horreorum, BARTON, Fragments N. H. Penna. 1799, 17.—BAIRD, Birds N. Am. 1858, 396.—A. & E. NEWTON, Ibis, 1859, 66 (Sta. Cruz; transient).—SCLATER & SALVIN, Ibis, 1859, 13 (Guatemala).—SCLATER, P. Z. S. 1864, 173 (City of Mex.).—LAWRENCE, Ann. N. Y. Lyc. 1861, 315 (Panama).—COOPER & SUCKLEY, P. R. R. Rep. XII, ii, 164 (south of Columbia River).

Hirundo rufa, VIEILL.—CABANIS, Ill.—BREWER, N. Am. Oöl. I, 1857, 91, pl. 7, fig. 63–67 (eggs).—Cab. Jour. IV, 1856, 3 (Cuba: spring and autumn).—REINHARDT, Ibis, 1861, 5 (Greenland: two specimens).—GUNDLACH, Cab. Jour. 1861, 328 (Cuba: common).

Hirundo americana, WILSON, Am. Orn. pl. 38, fig. 1, 2.—RICH.—LEMBEYE, Aves de Cuba, 1850, 44, lam. vii, fig. 2.

Hirundo rustica, AUD. Orn. Biog. II, pl. 173.—Ib. Birds Am. I, pl. 48.—JONES, Nat. Hist. Bermuda, 34 (Bermudas; Aug. and Sept.).

Hab. Whole of United States; north to Fort Rae, Slave Lake; Greenland; south in winter to Central America and West Indies. Not found at Cape St. Lucas.

The steel blue of the upper parts of this species has a decided violet tinge, sometimes purplish. The black or steel blue pectoral collar is very rarely continuous below in adults; when it is, it is usually formed in the centre by only one or two series of feathers, which are black to the down. The rufous of throat is a little darker

than that of under parts, and more continuous, though sometimes there is but little difference in the shade. The space just posterior to the collar generally appears lighter than on the belly. Usually, however, the rufous wash of under parts is decidedly paler than that of throat and forehead; sometimes quite pale; in only one or two instances as light as European specimens (as 6,020 and 29,294). In such cases, however, the absence of broad jugular band of continuous black, and the shorter tail, will distinguish from the European bird.

There is an occasional tendency to a widening of the jugular collar, especially in young birds, but this is so much mixed with rufous feathers as to be easily understood.

In young birds the frontal chestnut band is considerably reduced in size, and generally paler and duller in color.

The largest specimen of *H. horreorum* I have seen is No. 19,542, from Fort Rae. Here the wing measures 4.90, and the tail 4.50 (the usual length of tail is under 4.00); the next largest specimen being No. 34,349, from the Rocky Mountains. The maximum length of tail in specimens of *H. rustica*, of Europe, before me, is 5.00—the average being perhaps 4.50.

The series of specimens from western America is not sufficient to determine whether there is any essential difference; the bill, however, appears decidedly smaller.

I regret very much that the specimens from South America[1] at my command are too few to make a satisfactory comparison with the North American bird. There appears, however, to be a difference in a rather smaller bill, and in having the gloss of the upper parts steel green, rather than purple or violet. I am, however, much inclined to doubt whether there is any specific difference. The chestnut brown of the forehead is quite as deep and extensive as in the northern bird, although Burmeister describes it as whitish, passing behind into rust-yellow, and speaks of the whole under parts

[1] **Hirundo erythrogaster.**

Hirundo erythrogaster, Bodd. Tabl. Pl. enl. (724, fig. 1), 1783, 45 (Cayenne).—Sclater, Catal. 1861, 39 (Brazil).

Hirundo rufa, Gm. S. Nat. I, 1788, 1018 (Pl. enl. 724, fig. 1).—Burm. Ueb. III, 148 (Brazil).

Hirundo cyanopyrrha, Vieill. Nouv. Dict. XIV, 1817, 510.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,007	35	♂	Vermejo River.	Feb. 1860.	Capt. Page, Expl. of	Chr. Wood,
21,008	35	♀	"	"	" [Parana.	"

being rusty yellowish-red, without distinguishing the throat as darker. These characters certainly do not apply to the Paraguay skins in Capt. Page's collection, whatever they may to Brazilian specimens. These are moulting the large feathers of wing and tail.

The characters given by Burmeister to the North American bird, viz., "under parts white, the anal and crissal feathers alone rusty yellowish-red," do not belong to it, as shown above.

In this connection I may state that in the collection is a specimen of *H. rustica*, of Europe, taken at sea during a voyage from Norfolk to Rio Janeiro, probably carried westward by the prevailing winds in the æquatorial region.

Should, as is very probable, the South American bird prove identical with the more northern one, the name *rufa* must be adopted as having the priority.

Specimens in the collection from the whole United States from Atlantic to Pacific, and north to the boundary; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
19,542	..	..	Ft. Rae, Slave Lake.	...	L. Clarke, Jr.	.....
22,666	..	..	"	1861.	"	.....
34,349	..	♀	Los Pinos, N. M.	June 19, '64	Dr. E Coues.	.....
3,956	124	..	San Diego, N. Leon.	1853.	Lt. Couch.	.....
8,640	..	..	Indian Key, Fla.	Aug. 28, '57.	G. Wurdemann.	.....
33,586	..	..	Off coast Cuba.	April 1, '64.	Dr. H. Berendt.	.....
32,740	17,443	..	Mexico.	...	Verreaux.	.....
30,708	..	..	Dueñas, Guat.	1862.	O. Salvin.	Salvin & Godm.
...	147	..	Guatemala.	...	Cab. Lawrence.	.....
30,557	..	♀	At sea, W. C. Central America	Oct. 20, '63.	Capt. J. M. Dow.	.....

TACHYCINETA, Cab.

Tachycineta, CAB. Mus. Hein. 1850–1, 48. (Type *H. thalassina*, Sw.)

Nostrils lateral, overhung or bordered internally by incumbent membrane. Tarsi with the tibial joint covered by overhanging feathers, adherent a short distance along inner face, about equal to middle toe without claw. Lateral toes equal. Adhesion of basal joint of middle toe variable. Tail emarginate only, or slightly forked: fork not exceeding half an inch in depth. Color blue or green above, with or without metallic gloss; with or without white rump. Entirely white beneath.

Under this head I combine several variations of form which shade so gradually into each other that I can scarcely define them even as subgenera. The type (*thalassina*) differs from all the others in a small, narrow bill, weak feet, more extensively feathered tarsus, and in a peculiar softness of the plumage without metallic gloss, seen

perhaps only elsewhere in *Callichelidon cyaneoviridis*. The basal joint of middle toe is entirely adherent externally, and for more than half internally, and in this respect agrees with *leucoptera* and *albilinea*, while in *bicolor* and *leucorrhoa* it is adherent for only three-fourths externally, and about half internally.

The feet of *H. leucorrhoa* appear proportionally more robust than in other species, differing in this respect from its miniature, *albilinea*, which agrees better with the rest.

The following is a synopsis of the American species; all of which, as stated, are green above, with or without white rump; white beneath:—

a. *Tachycineta.*

Plumage soft and velvety, without metallic gloss. Sides of head, space around eyes, and whole under parts white; with the feathers all plumbeous at base. Female duller in plumage.

Above green, with various shades and tinges of violet and purple . . . . . *thalassina.*

b. ————.

Plumage above compact, and with rich (usually green) metallic gloss. Sides of head to line with eyes like its upper part. Beneath white, sometimes with ashy tinge across breast; the feathers of chin and throat, and generally of crissum, white to base. A concealed spot in jugulum.

Entire upper parts uniform in color.

Inside of wings and axillars ash color. No concealed basal white on the upper parts . . . *bicolor.*

Rump white. No white loral line.

Back green. Pure white beneath. Feathers of back and forehead with much concealed white at base. Edges of secondaries and greater coverts white *albiventris.*

"Back bluish or purple. A grayish band across breast. No white on wing. Feathers of back ————? at base" . . . . . *meyeni.*

Rump white. A distinct white loral line.

Rump plain white. Bases of dorsal feathers ashy. No shaft streaks beneath. Length, 5.50; wing, 4.50; tail, 4.40 . . . . . *leucorrhoa.*

Rump and under parts with more or less distinct dusky shaft streaks. Breast and sides with an ashy tinge. Length, 4.50; wing, 3.75; tail, 2.00 *albilinea.*

Hirundo bicolor.

Hirundo bicolor, Vieill. Ois. Am. Sept. I, 1807, 61, pl. xxxi.—Aud. Orn. Biog. I, pl. 98.—Ib. B. A. I, pl. 46.—Cassin.—Brewer, N. Am.

Ool. I, 1857, 100, pl. iv, fig. 47 (eggs).—LEMBEYE, Aves de Cuba, 1850, 46, lam. vii, fig. 2.—BAIRD, Birds N. Am. 1858, 310.—LORD, Pr. R. A. Inst. Woolwich, IV 1864, 15 (Br. Columbia; nesting).—JONES, Bermudas, 34 (Sept. 22, 1849).—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 184.—*Petrochelidon bicolor*, SCLATER, P. Z. S. 1857, 201.—Ib. 1859, 364 (Xalapa).—Ib. Catal. 1861, 40.—SCLATER & SALVIN, Ibis, 1859, 13 (Guatemala).—*Tachycineta bicolor*, CAB. Mus. Hein. 1850, 48; Jour. Orn. 1856, 4 (Cuba).—GUNDLACH, Jour. Orn. 1861, 330 (common in Cuba).

Hirundo viridis, WILS. Am. Orn. V, 1812, pl. 38.

Hirundo leucogaster, STEPHENS, Shaw, Gen. Zool. X, 1817, 105.

Hab. Whole United States, and north to Slave Lake, south to Guatemala; Bermudas; Cuba, common in winter. In summer on table-lands of Mexico.

I find no essential difference in coloration in a large series from different parts of North America, Mexico, and Guatemala. A skin from Fort Rae is larger than the rest, measuring—wing, 4.90; tail, 2.65. Carlisle specimens measure 4.75 and 2.50, respectively. In a single specimen in the museum of the Philadelphia Academy of Natural Sciences, from California, the back and rump have a steel blue gloss, rather than green—seen to less extent in some Smithsonian skins from the West Coast—while others exhibit nothing of the kind, and I cannot think that there is any good reason for supposing that there may be a western species as distinguished from an eastern. Western and Mexican skins have perhaps a rather smaller bill, and the feathers of the tarsus appear to extend farther along the inner side.

The occurrence of this species in the high region between Orizaba and City of Mexico, in June, as recorded below, is a fact of great interest.

Specimens from the whole United States from east to west, and north to boundary; also—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,640	..	♀	Moose Factory, H. B.	May 26, '60.	C. Drexler.	.....
32,342	..	..	"	...	J. M'Kenzie.	.....
27,299	1,298	..	Big Island, S. Lake.	...	J. Reed.	.....
31,223	..	..	"	...	"	.....
23,134	..	..	Fort Simpson.	...	B. R. Ross.	.....
27,300	1,331	♀	Fort Youkon.	June.	R. Kennicott.	.....
4,663	..	♂	Matamoras, Mex.	...	Lt. Couch.	Dr. Berlandier.
29,203	..	..	Orizaba, Mex.	...	Prof. Sumichrast.	.....
30,711	386	..	Vera Paz, Guat.	...	O. Salvin.	Salvin & Godm.
33,134	185	..	Pine region above	June, 1864.	Dr. Sartorius.	.....
33,135	193	..	"[Mirador, Mex.	...	.....	.....

Hirundo thalassina.

Hirundo thalassina, SWAINSON, Phil. Mag. I, 1827, 365 (Mexico).—AUD. Orn. Biog. IV, pl. 385.—IB. B. A. I, pl. 46.—BREWER, N. A. Ool. I, 1857, 102 (the fig. pl. v, fig. 74 of egg belongs to another species).—BAIRD, Birds N. Am. 1858, 311.—MAXAM. Cab. Jour. 1858, 101.—LORD, Pr. R. A. Inst. Woolw. IV. 1864, 115 (Vancouver Isl.; nests in holes of trees).—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 185 (W. T.).—*Chelidon thalassina*, BOIE, Isis, 1844, 171.—*Tachycineta thalassina*, CAB. Mus. Hein. 1850, 48.—*Petrochelidon thalassina*, SCLATER & SALVIN, Ibis, 1859, 13 (Guatemala).—SCLATER, Catal. 1861, 39, no. 239.—IB. P. Z. S. 1864, 173 (City Mex.)

Hab. Western and middle provinces of United States, south to Guatemala.

Specimens from different localities, as well as from the same place, vary somewhat in the shade of coloration. Sometimes, as in other Swallows, the innermost secondaries are edged and tipped with white, more or less conspicuously. Young birds are uniform lustreless grayish-brown above, something like *Cotyle riparia*, white below, with perhaps a tinge of ashy across breast; the upper surface of wings and tail with a greenish gloss; the whole side of head, including loral region and around the eye, dusky, not white as in the adult. The white feathers on the posterior inner face of the tarsus are more conspicuous than in the adult, and reach nearly two-thirds the way to the toes, but do not exist at the lower end as in *Cotyle riparia*, which at once distinguishes them. All the feathers of under parts, even of chin and throat, are gray at base, not white; those of breast plumbeous to near tips, with a central stripe of lighter (concealed).

Specimens (probably resident) from Cape St. Lucas are much smaller than from Upper California, the wing measuring 3.95, the tail 1.90 inches, while 1,895 measures 4.50 and 2.20, respectively. No. 29,204, from a typical locality (Orizaba), measures 4.70 and 2.40.

The fully fledged young bird differs so much in appearance from the adult, that I was at one time inclined to consider them as different species. The female is duller than the male, especially on the head and rump.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
19,350	..	..	Gray Bull Cr'k, Neb.	June 7, '60.	Capt. Raynolds.	G. H. Trook.
19,209	..	♂	Wind River, Neb.	May 28, '60.	"	Dr. Hayden.
6,965	330	♀	Medicine Bow Cr.	July 25, '57.	Lt. F. T. Bryan.	W. S. Wood.
11,038	..	♂	Fort Bridger.	May 21, '58.	C. Drexler.	.....
..	..	..	Victoria.	...	J. Hepburn.	.....
1,895	..	♂	Columbia River.	July 12, '35.	S. F. Baird.	J. K. Townsend.
1,945	..	♀	"	"	"	"
12,885	..	..	Napa Valley, Cal.	...	A. J. Grayson.	.....
12,949	657	..	San Jose, Cape St.	...	J. Xantus.	.....
12,950	667	..	" [Lucas.	...	"	.....
3,954	229	♂	Saltillo, Mex.	...	Lt. Couch.	.....
13,590	..	..	Mexico.	...	J. Gould.	J. Taylor.
..	151	..	"	...	Cab. Lawrence.	.....
29,204	285	..	Orizaba, Mex.	...	Prof. Sumichrast.	.....
30,710	385	♀	San Geronimo, Vera	...	O. Salvin.	.....
30,712	3,716	♂	" [Paz.	Jan. 1862.	"	.....

(1,895.) Type of Mr. Audubon's figure?

Hirundo albilinea.

Petrochelidon leucoptera, LAWRENCE, Ann. N. Y. Lyc. 1861, 317, no. 156 (Panama) (not of Gmelin).

Petrochelidon albilinea, LAWRENCE, Ann. N. Y. Lyc. VIII (read April 27), May, 1863 (Panama).

Petrochelidon littorea, SALVIN, P. Z. S. (read May 21) 1863, 189 (both coasts of Central America).

Hab. Line of Panama R. R., northward along coast of Central America; Mazatlan?

(No. 35,049, ♂.) Above glossy compact green, including head, back, upper tail coverts, and sides of head to the level of the gape and below the eye; wings and tail similar, but less brilliant. Rump all round, external edges of the central secondaries, entire under parts, including lining of wings and axillars, white, with perhaps a faint ashy tinge, especially across the breast; the shafts inclined to be dusky, especially on the rump. Lores greenish dusky, bordered above by an obscure white line from base of bill; the feathers of the hind neck and upper part of back, as well as those of the forehead, with much concealed white. There is a trace of a narrow pectoral collar of green on the sides of the breast, entirely interrupted below, however. The feathers of chin and throat entirely white, of crissum white, except at extreme bases.

The white of under parts appears perfectly pure on throat, middle of belly, and crissum; across the breast there is a shade of ashy, as also in the sides, most appreciable when the feathers are raised. On the rump the dusky shaft streaks are most decided, and towards the end involve the adjacent webs to some extent; below they are appreciable to a careful examination, except perhaps on the chin and throat. There is a good deal of white at the base of the tail feathers on the inner webs. There is also a gloss of violet, in some aspects, on the wings and tail.

(No. 35,049, ♂.) Total length, 4.25; wing, 3.75; tail, 1.90; depth of fork, .25; difference of primaries, 1.80; length of bill from forehead, .35, from nostril, .22, along gape .55, width of gape, .45; tarsus, .42; middle toe and claw, .55, claw alone, .18; hind toe and claw, .33, claw alone, .15.

The above description is taken from a type of Mr. Salvin's *P. littorea*. Mr. Lawrence's type of *albilinea* is almost precisely like it—a little larger, and with patches of a more bluish gloss on the back.

This species is very similar to *P. leucorrhoa*,[1] of Buenos Ayres, which is, however, much larger, and lacks the concealed white of the forehead and hind neck. The greenish-black collar margining the jugulum in *leucorrhoa* is more nearly continuous below, and is in a measure completed by concealed dusky edges to the feathers across the breast. There is no dusky appreciable on the shafts of the feathers of the under parts, and almost none on the rump, and there is no distinct white at the base of the tail feathers. The outer tail feather is narrowly edged with whitish.

An albino Swallow, collected by Col. Grayson, at Mazatlan, belongs, as nearly as I can ascertain, to *H. albilinea*.

Both these species are distinguished from *P. leucoptera* of eastern, and *P. meyeni* of western South America, by their white loral stripe or line. I add description of these two species in order to complete the history of the genus.

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[1] **Hirundo leucorrhoa.**

Hirundo leucorrhoa, Vieill. Nouv. Dict. XIV, 1817, 519, and Encycl. Méth. 1823, 523, Paraguay (Azara, Apunt. II, 509).—*Petrochelidon leuc.* Cab. Mus. Hein. 1850, 48.—*Cotyle leuc.* Burm. Uebers. III, 1856, 144.—Ib. La Plata Reise, 1861, 478 (Parana).

Hirundo frontalis, Gould, Pr. Zool. Soc. 1837, 22.—Ib. Birds Beagle, 1841, 40 (Monte Video).

"*Hirundo leucopyga*," Licht. Mus. Berol.—Cabanis, Mus. Hein. 48.

Hirundo gouldii, Cassin, Pr. A. N. Sc. 1850, 69 ("*H. frontalis*," Gould).

Hab. Paraguay and adjacent regions. Nests in hollow trees or holes in ground.

(No. 12,351.) Total length, 5.20; wing, 4.45; tail, 2.40; depth of fork, .20; difference of quills, 2.10? length of bill from forehead, .49, from nostril, .25, along gape, .61; tarsus, .50; middle toe and claw, .70, claw alone, .20; hind toe and claw, .46, claw alone, .21.

Smithsonian No.	Collector's No.	Sex and Age.	ocality.	When Collected.	Received from	Collected by
12,351	27	..	Buenos Ayres.	...	Capt. Page, U. S. S. Argentina.	.....

Smithsonian No.	Collector's No.	Sex and Age	Locality.	When Collected.	Received from	Collected by
34,036*	...	..	Mazatlan.	...	Col. Grayson	.....
35,041	393	♂	San José, Guat.	Jan. 1863.	O. Salvin	Salvin & Godman.
..	156	♂	Panama R. R.	...	Cab. Lawrence	M'Leod. & Gabb.

(34,036*) Albino. (35,041) Type of *Petrochelidon lithorus*. (156) Type of species.

Hirundo albiventris.

Hirundo albiventris, Bonn. 1792 (Beff. Pl. enl. 546, 2, Cayenne).—*Petrochelidon alb.* Sclater, Catal. 1861, 41, no. 247.

Hirundo leucopyga, Gm. S. N. II. 1788, 1022 (based on Pl. enl. as above).—Cab. Schomb. Guiana, III. 672.—*Petrochelidon leuc.* Cab. Mus. Hein. I, 46.—*Cotyle leuc.* Burm. Uebers. III. 1856, 143 (Brazil).—In. Reise La Plata, II, 1861, 475 (Banda Oriental).

Bill very large; tail much emarginated. Above glossy metallic greenish-blue on the head, more bluish-green on the back. Rump white (but not tail coverts, which are like the back) all round, as also entire under parts, including inside of wings. Outer edges of the inner secondaries, and inner great coverts, most of inner webs of lateral tail feathers and basal portion of feathers of whole back, hind neck, and forehead also white. No trace of an interrupted pectoral collar, except concealed basal gray across the breast, darkest in a median spot. Only occasional and almost inappreciable dusky shaft streaks. Feathers of chin and throat entirely white, those of the crissum with the extreme root only plumbeous.

Young birds appear to have more white on the wings.

(No. 35,056.) Total length, 5.40; wing, 4.20; tail, 2.25; fork, .34; difference between quills, 2.10; length of bill from forehead, .50, from nostril, .27, along gape, .65; width of gape, .50; tarsus, .44; middle toe and claw, .60, claw alone, .19; hind toe and claw, .36, claw alone, .19.

P. meyeni[1] (*leucopyga*, Meyen, *nec* Licht.) I have not seen, though it is said to be closely allied, but to differ in a steel blue back, a grayish band across the breast, and the absence of white edges to the wing feathers, thus probably more like *leucorrhoa*, but without the white loral line, and with a decided grayish pectoral band.

[1] **Hirundo meyeni (leucopyga).**

Hirundo leucopyga, Meyen, Nova acta Ac. L. C. XVI, II, 1834, suppl. 73, pl. x (Chile).—*Cotyle leu.* Burm. Uebers. III, 1856, 144.—*Hirundo leucopygia*, Gould, Birds Beagle, 1841, 40 (Valparaiso and Tierra del Fuego).

Petrochelidon meyeni, Cab. Mus. Hein. I, 1850, 48.—Sclater, Catal. 1861, 40, no. 246.—Cassin, Catal. Hir. 1853.

Hab. Coast of Chile and Patagonia.

Note.—If *leucopyga*, as used by Lichtenstein for *H. leucorrhoa*, be merely a museum name, as appears probable, it should stand for the present species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
35,056	..	..	Brazil.	...	Acad. Nat. Sciences.	.....
..	342	..	Bahia.	...	Cab. Lawrence.	.....

CALLICHELIDON, Bryant.

Callichelidon, BRYANT, MSS. (Type *H. cyaneoviridis*, BRYANT.)

Nostrils lateral; overhung by membrane. Tarsi lengthened; equal to middle toe and more than half the claw; entirely bare of feathers. Basal joint of middle toe entirely adherent externally, for more than half internally. Lateral toes equal, or outer a little the longer. Tail deeply forked; the feathers somewhat attenuated; as long as the wings.

Above green, beneath white.

The type of this new subgenus, perhaps entitled to rank as a full genus, has the same soft velvety condition of the dorsal plumage, without metallic lustre, as in *thalassina*. The tail is deeply forked and the lateral feathers narrow and tapering from the base. The second species, placed here provisionally on account of the long bare tarsi, exhibits on the back a strong metallic lustre, and the tail is less deeply forked.

The legs are longer and more naked than in other American Swallows—in this respect approaching *Cheramœca*, of Cab. (*C. leucosterna*, of Australia). Here, however, the outer toe is said to be shorter than inner; the claws very large, the outer toe but little adherent at base.

Synopsis of Species.

Above soft velvety grass green, changing to blue on rump. Beneath pure white. Feathers of chin and throat white to base . . . . . *cyaneoviridis.*

Above metallic golden-green. Beneath white; the chin dusky. Feathers of chin and throat plumbeous at base; of breast with large greenish spots, somewhat concealed . . *euchrysea.*

Hirundo cyaneoviridis.

Hirundo cyaneoviridis, BRYANT, Pr. Bost. N. H. Soc. VII, 1859, 111 (Nassau, N. P., Bahamas; very abundant).—*Callichelidon cyaneoviridis*, BRYANT, MSS.

Hab. Island of New Providence, Bahamas.

(No. 11,946.) Upper parts soft velvety green, with a slight occasional gleam of golden, passing on the wings into greenish-blue, and on the rump

and upper tail coverts into greenish blue and violet. Beneath pure white, the sides and linings of wings faintly tinged with ashy. Ear coverts white, tinged at ends with dusky; traces of a narrow dusky collar on the sides of the jugulum. Feathers of chin and throat white to very base, those of jugulum and rest of under parts lead color towards roots. The lateral tail feathers externally are edged narrowly with whitish. The ends of the quills have a violet tinge. The bases of the feathers of nape and forehead light gray, but not white.

Total length, 5.80; wing, 4.60; tail, 3.00; depth of fork, 1.00; difference between primaries, 2.35; length of bill from forehead, .44, from nostril, .23, along gape, .57, width, .47; tarsus, .49; middle toe and claw, .56, claw alone, .20; hind toe and claw, .36, claw alone, .20.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
11,946	..	..	Nassau, Bahamas.	April, 1859.	Dr. H. Bryant.	.....

(11,946.) Type.

Hirundo euchrysea.

Hirundo euchrysea, GOSSE, Birds Jamaica, 1847, 68 (Jam.).—IB. Ill. tab. xii.—MARCH, Pr. A. N. Sc. 1863, 295.—*Herse euchrysea*, BP. Consp. 341.—*Petrochelidon eu.* SCLATER, P. Z. S. 1861, 72.—IB. Catal. 1861, 39, no. 240 (Jam.).

Hab. Jamaica.

(No. 23,333, ♀.) Above bright and lustrous metallic green and golden, variously blended; the quills and tail feathers, with lining of wings and axillars, similar, but duller. Beneath white; the metallic green of the head extending on the edge of the chin, the middle part of which is grayish; the jugulum and breast with large dull spots somewhat like the back. Down of the back of neck and of the back rather dark ashy. Tibiæ brown. Quill and tail feathers blackish-brown, glossed as described. Feathers of chin and throat gray at extreme base.

(No. 23,333, ♀.) Total length, 4.70; wing, 4.35; tail, 2.30; difference of primaries, 2.10? length of bill from forehead, .37, from nostril, .20, along gape, .47, width, .35; tarsus, .42; middle toe and claw, .48, claw alone, .15; hind toe and claw, .28, claw alone, .14.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,333	77	♀	Trelawney, Jam.	June 19, '59.	P. L. Sclater.	W. Osburn.
30,284	..	..	Spanishtown, Jam.	Jan. 1863.	W. T. March.	.....

ATTICORA, Boie.

Atticora, Boie, Isis, 1844. (Type *Hirundo fasciata*, Gm.)

Atticora, in its more extended sense, includes a series of small species (the least of the American members of the family) with diminutive bills, the nostrils superior and broadly open, bordered behind by membrane, but not overhung laterally. The tarsi long in proportion, equalling the middle toe and half the claw; either slightly feathered above, or entirely bare; the adhesion of the middle toe to the outer variable, but carried to its maximum extent in some forms. Tail forked, sometimes very deeply. The subdivisions are as follows:—

Pygochelidon.—Basal joint of middle toe adherent, except at extreme end. Tarsus feathered at upper end on inner face. Dusky, or else lustrous black above and on crissum.

Atticora.—Basal and middle joints of middle toe adherent externally. Tarsus feathered above. Tail very deeply forked. Lustrous black, with pectoral band and tibia white.

Notiochelidon.—Basal and half of middle joints of middle toe adherent externally; tarsi entirely bare. Top of head, wings, and tail black; brown on back and crissum.

Neochelidon.—Toes as in last; tarsus feathered above. Dull lustreless brown.

In all the species the feathers of chin and throat are plumbeous at base.

Atticora, Boie.

Nostrils superior, broadly open and circular; bounded for posterior half by membrane; not overhung, however, on the inner side. Frontal feathers soft, smooth, without any bristles, neither at base of upper mandible nor on chin. Bill small and delicate. Legs rather large and stout, the toes shorter than usual; tarsus nearly equal to middle toe and claw, the tibial joint with feathers attached, and slightly invading and overhanging upper end, but not extending along inner face. Outer and middle toes connate for half the length of the latter, leaving only the terminal joints of each (exclusive of claws) free; the basal joint of middle toe adherent to the outer toe. The claws sharp and curved; the lateral toes equal.

Tail deeply forked, extending beyond wings; lateral feathers tapering, but not attenuated, one-half longer than the middle.

Color entirely lustrous black, with white abdominal band and tibia.

The great amount of adhesion of the toes characterizes this sub-

genus among American Swallows. In two specimens before me I can make out only ten tail feathers, and cannot say whether more exist. Neither has the wings perfect, so that I cannot indicate the number of primaries. The type, and hitherto single representative of the section, is *A. fasciata*, of Cayenne.[1]

NOTIOCHELIDON, Baird.

Notiochelidon, BAIRD. (Type *Atticora pileata*, GOULD.)

Bill small; nostrils superior, as in *Atticora*, but less perfectly circular. Tarsi entirely bare, even on the joint of tibia, rather long—equal to middle toe and half claw. Lateral toes short; about equal, or the outer a little the longer; the claws all stout, sharp, much curved. Outer toe adherent for nearly half its length (two terminal joints free); the terminal one and a half joints, or three-fifths of middle toe free. Inner toe united to basal two-thirds of middle. Tail deeply forked for about one-third the length, the branches divaricated.

No metallic lustre, except upon the top of head. Beneath white; the crissum blackish.

This form differs from typical *Atticora* in less deeply forked tail, and in less adhesion of toes—the middle toe being free externally for one and a half joints, instead of only one, and internally in proportion. The feet are more slender, and the claws less curved; the tarsus entirely bare, even to the joint.

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[1] **Atticora fasciata.**

Hirundo fasciata, GM. S. N. I, 1788, 1022 (based on Pl. enl. 724, fig. 2, (Cayenne).—Sw. Zool. Ill. 2d ser. pl. xvii.—*Atticora fasciata*, BOIE, Isis, 1844, 172.—BURM. Ueb. III, 1857, 146.—SCLATER, Catal. 1861, 39, no. 236.

Hab. Brazil and Cayenne.

Entirely glossy black, with faint dark steel blue lustre; wings and tail duller. A sharply defined white band across the sides and middle of breast; tibiæ white. The claws very sharp.

(No. 149.) Total length, 5.40; wing, 3.90; tail, 3.20; depth of fork, 1.20; length of bill from forehead, .37, from nostril, .20, along gape, .46, width, .38; tarsus, .50; middle toe and claw, .50, claw alone, .19; hind toe and claw, .34, claw alone, .19.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
35,097	813	♂	Cayenne.	...	Acad. Nat. Sciences.	.....
..	149	..	"	...	Cab. Lawrence.	.....

Atticora pileata.

Atticora pileata, GOULD, Pr. Z. S. 1858, 355 (Guatemala).—SCLATER & SALVIN, Ibis, I, 1859, 13.

Hab. Guatemala.

(No. 30,714, ♂.) Top and sides of head and neck black, with dull bluish gloss. Interscapular region and sides of body smoky brown; above passing rather gradually into blackish-brown of rump, wings, and tail; beneath abruptly defined against blackish-brown of crissum. Rest of under parts and tibiæ white; this color, however, on the chin, throat, and jugulum (the former two especially) margining the feathers narrowly only, and exposing much of the smoky brown bases. Tibial feathers brown at base.

(No. 30,714, ♂.) Total length, 4.75; wing, 3.75; tail, 2.45; depth of fork, .75; difference of primaries, 1.75; length of bill from forehead, .33, from nostril, .17, along gape, .43, width, .35; tarsus, .43; middle toe and claw, .50, claw alone, .20; hind toe and claw, .35, claw alone, .17.

This species is totally different in appearance from any other known American Swallow. Cabanis is in error in suggesting that it may be the young of *cyanoleuca*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,713	3,704	♀	Coban, Vera Paz.	Feb. 1862.	O. Salvin.	Salvin & Godman.
30,714	377	♂	"	"	"	"

NEOCHELIDON, Sclater.

Neochelidon, SCLATER, Catal. Am. Birds, 1862, xvi. (Type *Hirundo tibialis*, CASSIN.)

Microchelidon, SCLATER, Catal. 1861, 39. (Same type; name preoccupied.)

Similar to preceding in bill and toes; the tarsus, however, with the joint covered with feathers, which invade the inner face at the upper end. Tail less forked; fork one-fourth the length.

Atticora tibialis.

Petrochelidon tibialis, CASS. Pr. A. N. Sc. 1853, 370 (Brazil).—*Microchelidon tibialis*, SCLATER, Catal. 1861, 39, no. 238.—*Neochelidon tibialis*, SCLATER, Catal. 1862, xvi (Errata).

Hab. Isthmus of Panama to Brazil.

The type of the section is the *H. tibialis*, of Cassin. This species is the least of our Swallows, and resembles a Swift rather than a Swallow. It is dark smoky or sooty brown above and on crissum,

the rump and under parts paler, the tibia white. A second species appears to be *N. fucata*.[1]

(No. 150, Panama.) Total length 4.00; wing, 3.45; tail, 2.00; depth of fork, .45; difference between 1st and 9th quills, 1.60; length of bill from forehead, .27, from nostril, .17, along gape, .43; width at base, .32; tarsus, .35; middle toe and claw, .45, claw alone, .17; hind toe and claw, .28, claw alone, .11.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	150	..	Panama R. R.	...	Cab. Lawrence.	M'Lean & Galb.

PYGOCHELIDON, Baird.

Pygochelidon, BAIRD. (Type *Hirundo cyanoleuca*.)

Bill minute. Nostrils broadly oval, nearly superior; the plane of their outline directed obliquely forwards and inwards; not overhung anteriorly on inner edge by membrane. Tarsi rather long, equal to middle toe and half claw; the joint and upper end on inner face with adherent feathers. Inner toe slightly longer. Basal joint of middle toe adherent externally, except just at the end; internally for half the length. Tail forked for about one-fourth the length.

This subgenus differs from its other allies with the nostrils superior,

[1] **Atticora fucata.**

Hirundo fucata, TEMM. Pl. col. 161, fig. 1 (Paraguay).—BURM. Uebers. III, 145.—*Cotyle fucata*, BOIE, Isis, 1844.—CAB. M. H. I, 49.—BURM. Uebers. III, 1856, 145.—IB. Reise La Plata, II, 1861, 478 (Mendoza).

Hab. Paraguay, Argentina, and La Plata basin generally?

This species has usually been placed in *Cotyle*, but probably on account of the dull brown color of upper parts, somewhat like that of *C. riparia*. The head and neck all round, with the jugulum, are reddish fulvous, above, however, only tinging the dark brown of the head. The breast and sides are brownish, the belly and crissum white, all tinged with reddish; in general aspect, except the reddish color, much like *C. riparia*. It differs, however, in exposed nostrils, more connate and shorter toes, short claws, and absence of tuft of feathers at lower end of tarsus.

In some respects, however, it differs decidedly from *Neochelidon*, as in having some bristles in the chin and along the base of commissure. The outer toe is a little shorter than inner, not a little longer; the fork of the tail is shallower, the feathers broader and more rounded at tip. In many respects there is quite a close relationship to *Petrochelidon*, differing chiefly in the shorter and more adherent toes. The style of coloration is quite similar.

in having the toes more deeply cleft—the basal joint of the median being free at its extremity on the outer side, instead of being adherent to the middle, or even the end of the middle joint. From *Petrochelidon* it differs in the longer tarsi, which equal the middle toe and half its claw, not the middle toe alone; less completely feathered tarsi at upper end; and in wanting the bristles in the chin and at base of bill above, which are soft and smooth. While the nostrils in *Petrochelidon* appear in the dried skin to be entirely without membrane, in *Pygochelidon* they are bordered behind and internally for a short distance, without, however, being overhung.

Synopsis of Species.

Above and on crissum uniform lustrous blue-black. Beneath white; the feathers of chin and throat dark plumbeous at base.

- Breast with a black pectoral band. Feathers of back scarcely white towards their middle portion. Crissum entirely black . . . . . *melanoleuca.*
- Breast without pectoral band. Feathers of upper back white in middle. Crissum with all feathers entirely black . . . . . *cyanoleuca.*

(Var. *montana* with larger bill.)

- Breast without band. Crissum white towards anus; long feathers only black, and towards their tips. Feathers of upper part of back ash-colored, not white in middle *patagonica.*

Above and on crissum greenish-black. Beneath dark ashy; the feathers of chin and throat plumbeous at base.

- Feathers of upper part of back cinereous, not whitish in the middle . . . . . *murina.*

Atticora cyanoleuca.

Hirundo cyanoleuca, Vieill. Nouv. Dict. XIV, 549, and Encycl. Méth. 1823, 521 (based on *Golondrina de la timoneles negros*, Azara, Apunt. Pajaros Par. II, 1805, 508).—*Atticora c.* Cab. Mus. Hein. 1850, 47.—Burm. Uebers. III, 1857, 146.—Ib. La Plata Reise, II, 1861, 479 (very common in the La Plata country; nests under eaves and roofs of houses).

Hirundo melampyga, Licht. Verz. 1823, 57 (Bahia).

Hirundo minuta, Max. Beit. III, 369.—Temm. Pl. Col. 209, fig. 1.

Hab. La Plata basin? Brazil.

(No. 35,050.) Above and on sides of head and neck to line of gape, steel blue, including tail- and lesser wing coverts, as well as a patch on side of breast; wings and tail feathers dark blackish-brown, with faint gloss. Feathers of hind neck and interscapulum with concealed white in their middle portion. Beneath white, all the feathers blackish plumbeous at the base, ex-

tending rather further along on the breast; the feathers in the middle of the breast with a darker patch on their inner webs, only visible on raising the feathers. Entire crissum from anus black, glossed on surface with steel blue, the bases all dark plumbeous. Lining of wings and axillars dark smoky brown; side of body under wings washed with grayish brown. Tibia brown, the feathers slightly tipped with whitish.

Immature specimens show traces of a fulvous or rusty yellowish wash on the under parts.

(No. 35,050.) Total length, 4.80; wing, 3.85; tail, 2.40, fork, .45; difference of quills, 1.68; length of bill from forehead, .31, from nostril, .16, along gape, .45, width, .32; tarsus, .41; middle toe and claw, .53, claw alone, .15; hind toe and claw, .35, claw alone, .16.

A. melanoleuca[1] appears to differ principally in having a black pectoral band. *A. patagonica* has the base of crissum white; the interscapular feathers gray in the middle, not white.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
35,050	65	♀	Bahia Negra.	June, 1859.	Capt. Page, Expl.	Chr. Wood.
32,743	10,140	♂	Brazil.	...	Verreaux.[Parana.	.....
15,006	..	..	"	...	U. S. Expl. Exped.	T. R. Peale.
15,002	..	..	"	...	"	"
..	150	..	Bahia.	...	Cab. Lawrence.	.....

Atticora cyanoleuca, var. montana.

Atticora cyanoleuca, var. *montana*, BAIRD.—?*Petrochelidon cyanoleucus*, SCLATER, P. Z. S. 1858, 551 (Riobamba).—IB. 1859, 138.—IB. 1860, 75 (Quito); 85 (Nanegal).—IB. Catal. 1861, 40, no. 241.—*Atticora cyanoleuca*, CAB. Jour. f. Orn. 1861, 91.

Hirundo melampyga, TSCHUDI, F. Peruana, 133 (not of LICHT.).

?*Hirundo cyanoleuca*, DARWIN, Birds Beagle, 41 (Valparaiso; builds in holes in banks).

Hab. Costa Rica: south along Andes to Chile?

(No. 34,676, ♀.) Very similar to *A. cyanoleuca*, of Brazil, in color and size, although rather smaller, except that the tail is more deeply forked (.60 deep, instead of .45); the bill larger, broader, and more depressed (from nostril .18, instead of .16); the sides of the body under the wings blackish, with slight steel blue gloss (in true *cyanoleuca* merely brownish dusky, without gloss). Upper parts glossed with violet, instead of uniform steel blue, having a tinge of greenish. A slight, almost inappreciable wash of rusty yellowish beneath.

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[1] **Atticora melanoleuca.**

Hirundo melanoleuca, MAX. Beit. III, 371 (Brazil).—TEMM. Pl. Col. 209, 2.—*Atticora m.* BURMEISTER, Uebers. III, 1856, 146 (Central Brazil). Middle of dorsal feathers white; tail 3½.

Hab. Brazil.

(No. 34,676, ♀.) Total length, 4.65; wing, 3.75; tail, 2.40, depth of fork, .60; difference between primaries, 1.65; length of bill from forehead, .32, from nostril, .18, along gape, .46; tarsus, .40; middle toe and claw, .50, claw alone, .16, hind toe and claw, .34, claw alone, .17.

A young bird has the upper parts dull dark smoky-brown, with a greenish-blue gloss on the middle of the back only. The under parts are white, tinged with brownish-yellow on the chin, becoming paler on the throat; a jugular band and the sides, especially behind, strongly tinged with the same. The feathers of the crissum are dark brown, without gloss, and margined with paler. A still younger specimen (33,289) has only the faintest possible trace of blue gloss on the back; the rump is smoky brown, lighter than the wings and tail; the brownish tinge of under parts deeper and more extended.

The characters assigned to this variety, although apparently slight and untangible, are yet quite appreciable on a comparison with a large series of Brazilian specimens. The larger bill and deeper fork of the tail are especially noticeable. The supposed difference in amount of black on the sides may be more apparent than real.

I am inclined to refer to this variety all the specimens I have seen from Bogota, and one from Peru—these agree in the larger and more depressed bill; one of the former, however (No. 24,953), has the upper parts with a green lustre, as in *bicolor*, not blue.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,676	..	♀	Barranca, C. R.	April 16,'64.	J. Carmiol.	.....
34,674	..	♂	San Jose, C. R.	May 29, '64.	"	.....
34,675	...	♂♀	"	"	"	.....
29,549	172	..	"	1858.	Berlin Mus.	.....
24,953	..	..	Bogota.	...	L. de Geofroy.	.....
32,739	40,654	♂	"	...	Verreaux.	.....
14,948	379	♂	Peru.	...	U. S. Expl. Exped.	T. R. Peale.

(24,953.) Green lustre.

The two species of the subjoined foot-note are introduced to complete the history of the subgenus.[1]

[1] **Atticora patagonica.**

Hirundo patagonica, D'Orb. & Lafr. Syn. Av. 1837 (Chile and Patagonia).

Atticora hemipyga, Burm. Reise La Plata, II, 1861, 479 (Mendoza).

Hab. Uruguay and Patagonia.

(No. 21,039.) Above, and on sides of head and neck to line of commissure, glossy steel blue; the wings and their coverts, with tail, dull dark brown, the lesser coverts only slightly glossed at ends. None of the feathers with

STELGIDOPTERYX, BAIRD.

Stelgidopteryx, BAIRD, Birds N. Am. 1858, 312. (Type *Hirundo serripennis*, AUD.)

Bill rather small; nostrils oval, superior, margined behind, but scarcely laterally by membrane, but not at all overhung; the axes of the outline con-

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concealed white, but dark gray in the middle. Beneath white, all the feathers dark plumbeous at base; the breast with a grayish shade across it owing to the fact that the feathers there are grayish-brown, rather narrowly edged with white, less pure than on the throat, and allowing this gray to show through as well as among the whitish. The crissal feathers immediately behind the anus are white; the longer ones are white, or grayish-white at base, and then blackish, glossed with steel blue at the end. The axillars and inside of wings are brownish-gray. The sides of body under the wings are slightly soiled with gray. Bill black; feet apparently flesh color.

(No. 21,039.) Total length, 5.00; wing, 3.90; tail, 2.55, perpendicular depth of fork, .40; difference of quills, 1.63; length of bill from forehead, .40, from nostril, .19, along gape, .51, width, .40; tarsus, .50; middle toe and claw, .60, claw alone, .16; hind toe and claw, .38, claw alone, .17.

This species appears quite distinct from the *cyanoleuca* of Brazil, in slightly larger size, much larger bill and feet, absence of white in the interscapular feathers, and of bluish gloss on the lesser wing coverts; lighter color of bases of feathers below; grayish breast, the feathers less tipped with white; white feathers behind the anus, and whitish bases of the rest of crissal feathers (not black); lighter tibiæ, etc. The lateral tail feathers are rather narrower, and not acuminated or attenuated at the end—the outline of inner web towards the end being convex, not concave.

It is a question whether this is not the real *H. cyanoleuca*, of Vieillot, as based on Azara's description. If so, the Brazilian *cyanoleuca* will take for name one of its synonyms.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
21,039	108	♂	Uruguay.	Sept. 1860.	Capt. T. J. Page, Parana Expl.	Chr. Wood.
21,040	108	♀	"	"	"	"

Atticora murina.

??Hirundo cinerea, GM. S. N. I, 1788, 1026 (based on *L'Hirondelle de Perou*, BRISS. II, 1760, 498, *ex* Feuillé Journ. Obs. 1725).—*Atticora cinerea*, SCLATER, Catal. 1861, 39, no. 237.

Petrochelidon murina, CASSIN, Pr. A. N. Sc. 1853, 370 (Ecuador).—SCLATER, P. Z. S. 1860, 74.

?Atticora cyanophæa, CABANIS, Jour. Orn. 1861, 92 (Bogota).

Hab. Andes of South America.

I am by no means satisfied that the bird of Brisson is the present species,

verging. Frontal feathers soft, and, like chin, without bristles. Tarsi equal to middle toe without claw; the upper end covered with feathers all round, none at lower end. Basal joint of middle toe adherent externally nearly to end; internally, scarcely half. Lateral toes about equal, their claws not reaching beyond base of middle claw. Tail slightly emarginate; the feathers broad, and obliquely rounded at end. Edge of wing rough to the touch; the shafts of the fibrillæ of outer web of outer primary prolonged and bent at right angles into a short stiff hook.

Color dull brown above.

The great peculiarity in this genus consists in the remarkable roughness of the edge of the wing, said to occur also in *Psalidoprocne*, Cab. The object is uncertain, but is probably to enable the bird to secure a foothold on vertical or inclined rocks, among or on which it makes its nest. A favorite breeding place of *S. serripennis* is in the piers and abutments of bridges, and these hooks might render essential aid in entering into their holes.

The birds of this genus have usually been referred to *Cotyle*, which, however, they resemble only in color. The nostrils are exposed, instead of being overhung; the tarsus is bare below, not feathered, and the lateral claws are considerably curved, and not reaching beyond the base of the lateral, as in *Cotyle*. The structure of the wing is very different.

According to Cabanis, *Psaridoprocne* (*P. cypselina*, Cab. of Africa) has the same structure of wing, but it seems to differ in having the tail deeply forked, as in *Atticora;* the toes and nails even shorter than in *Atticora*, not longer; and in having the outer toe shorter than the inner, instead of equal to it.

The genus has a wide range, extending from British America to Brazil, and probably Ecuador.

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as his description of the tail and its under coverts, at least, does not apply at all. Brisson's article is evidently copied from Feuillé (1725), a very vague author, as likely to call a Cuckoo or Flycatcher "*Hirundo*" as anything else.

This species is much in form like *A. cyanoleuca*, but considerably larger. I have little doubt that the *A. cyanophœa*, of Cabanis, is the young bird of this species, as a specimen in the museum of the Philadelphia Academy, from Bogota, agrees exactly with Cabanis's description, and is hardly to be distinguished, except in its evident immaturity, from the Academy-type of Cassin's *Petrochelidon murina*, from Ecuador. It is probably closely related to the *H. andecola*, of D'Orb. & Lafr. Syn. Av. 1837, 69 (La Paz), but differs somewhat.

Synopsis of Species.

Chin, throat, and breast nearly uniform mouse gray.

Above uniform smoky brown. Under parts white, except as described. Crissum white, not banded . . . . *serripennis.*

Chin and throat reddish fulvous, in strong contrast with gray of breast and sides. Belly tinged with sulphur yellow. Crissum white.

Above uniform brown, or with rump gradually paler, but not contrasted with back.

Crissum banded at end with blackish; sulphur yellow of belly well marked . . . . *ruficollis.*

Crissum plain white; belly scarcely yellow . . *fulvipennis.*

Above brown; the rump appreciably and abruptly paler (light gray).

Crissum banded at end with black . . . *uropygialis*

Crissum plain white(?). Color much darker and size smaller than preceding . . . . *gutturalis.*

Stelgidopteryx serripennis.

Hirundo serripennis, AUD. Orn. Biog. IV, 1838, 593.—IB. B. Am. I, 1840, 193, pl. 51.—*Cotyle s.* BON. Consp. 1850, 342.—CASSIN.—BREWER, N. Am. Ool. I, 1857, 106, pl. iv, fig. 50 (eggs).—BAIRD, Birds N. Am. 1858, 313.—LORD. Pr. R. A. Inst. IV, 1864, 116 (Br. Columbia).—COOPER & SUCKLEY, P. R. R. Rep. XII, II, 186 (W. Terr.)—HEERMANN, P. R. R. X; Williamson's Rep. 36 (San Antonio, Tex.; breeding).—*Stelgidopteryx s.* BAIRD, Birds N. Am. 1858, 312.

Hab. Whole United States (exclusive of N. E. States?), south to Central Mexico.

(No. 32,269, ♂.) Above smoky brown, rather deeper on the head, perhaps a little paler on the rump. Larger quills and tail feathers dusky brown; the secondaries and greater coverts sometimes lighter along their external edges. The under parts (for about half the total length) from bill to and including breast, with the sides of body and lining of wings, mouse gray, rather lighter along the throat; the rest of under parts, including crissum, white, the latter with the shafts sometimes dusky, and very rarely with dusky blotches at the ends of the longer feathers.

Young birds (as 1,120) differ in a tinge of reddish fulvous on the upper parts; the wing coverts, secondaries, and inner primaries margined more or less broadly with a brighter shade of the same. The gray of the under parts is also washed with this color, especially on the chin and across the breast. The hooks of the edge of the wing have not yet become developed.

(No. 32,269, ♂, fresh specimen before being skinned.) Total length, 5.40; expanse of wings, 12.20; wing from carpal joint, 4.50.

(No. 32,269, ♂, prepared specimen.) Total length, 5.20; wing, 4.50; tail,

2.25, depth of fork, .15; difference of primaries, 2.28; length of bill from forehead, .40, from nostril, 24, along gape, .56, width of gape, .43; tarsus, .45; middle toe and claw, .57, claw alone, .19; hind toe and claw, .41, claw alone, .16.

The differences between this species and *ruficollis*, the South American representative, are given below.[1]

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[1] **Stelgidopteryx ruficollis.**

Hirundo ruficollis, VIEILL. Nouv. Dict. XIV, 1817, 523.—IB. Encycl. Méth. II, 525 (Brazil).—*Cotyle ruficollis*, SCLATER, P. Z. S. 1860, 292.—IB. Catal. 1861, 41, no. 249.

Hirundo flavigastra, VIEILL. Nouv. Dict. XIV, 1817, 534.—IB. Encycl. Méth. II, 531 (based on Azara, as below, from Paraguay).—*Cotyle flavigastra*, BOIE, Isis, 1844, 170.—BON. Consp. 1850, 342.—BURM. Uebers. III, 1856, 144.

Hirundo hortensis, LICHT. Verz. Doubl. 1823, 57 (Bahia).—TEMM. Pl. Col. 161, 2.

Hirundo jugularis, MAXIM. Beit. III, 365 (Brazil).

Hirundo flaviventer, LESSON, Traité d'Orn. I, 1831, 269 (Brazil).

Golondrina de la vientre amarillazo, AZARA, Apunt. II, 1805, 512.

Hab. La Plata region and Brazil. (Farther north and in the Andes replaced by *uropygialis*?)

(No. 32,742, ♀.) Above, with sides of head, smoky brown; darker on the head, becoming sensibly paler on rump, especially on the edges of the feathers, but still not in any decided contrast with the lower part of back; the primary quills and tail feathers dark dusky brown; the secondaries whitish along their outer edges towards the end and at the tip. Chin and throat reddish fulvous; breast and sides of body, with inside of wings, brownish-gray; the median region of body white, tinged with sulphur yellow. Under tail coverts, from vent, pure white, with a slight gloss of yellow (less than on belly), the longest feathers abruptly tipped with the color of the tail (for nearly half an inch), the shafts of some others dusky. Feathers of tibia brown, tipped with yellowish-white.

(No. 32,742.) Total length, 5.50; wing, 4.55; tail, 2.50, depth of fork, .13; difference of primaries, 2.10; length of bill from nostril, .21, along gape, .55, width, .42; tarsus, .40; middle toe and claw, .52, claw alone, .18; hind toe and claw, .32, claw alone, .15.

The upper parts are colored much as in *C. serripennis*, rather darker perhaps, and the rump rather paler, forming a greater contrast. The whitish edging of the secondaries is more decided. Beneath, however, the colors are decidedly different. The tail is much longer; the feet and bill smaller.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
15,000	..	..	Brazil.	...	U. S. Expl. Exped.	T. R. Peale.
32,742	35,370	♂	"	...	Verreaux.	.....
16,344	92	♀	"	July, 1859.	Capt. T. J. Page, Expl. of Parana.	Chr. Wood.

Specimens in the collection from various points in United States, especially—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,289	..	♂	Macon, Ga.	...	Jos. Leconte.	.....
2,209	..	♂	Carlisle, Pa.	May 3, '45.	"	.....
3,370	..	♀	"	May, 1847.	"	.....
10,120	..	..	Washington, D. C.	...	J. C. McGuire.	.....
2,899	..	..	Charleston, S. C.	...	S. F. Baird.	J. J. Audubon.
32,268	..	..	Liberty County, Ga.	...	Jos. Leconte.	.....
34,179	11	♂	Sioux City, Neb. [T.	May 4, '60.	Capt. J. Feilner.	.....
6,034	81	..	Shoalwater Bay, W.	June, 1854.	Dr. J. G. Cooper.	.....
6,033	82	..	Steilacoom, W. T.	...	Dr. Suckley.	.....
6,032	..	..	Sacramento, Cal.	...	Lt. Williamson.	Dr. Heermann.
11,052	..	..	Fort Bridger, Utah.	June 3, '58.	C. Drexler.	.....
3,957	131	..	New Leon, Mex.	April, 1853.	Lt. Couch.	.....
36,999	704	♀	Fort Whipple, Ar.	Sept 8, '64.	Dr. E. Coues.	.....
32,741	46,971	♂	Mexico.	...	Verreaux.	.....

Stelgidopteryx fulvipennis.

Cotyle fulvipennis, SCLATER, P. Z. S. 1859, 364 (immature bird; Jalapa, Mex.).—SCLATER & SALVIN, Ibis, 1860, 31 (Guatemala).

? *Cotyle serripennis*, SCLATER, P. Z. S. 1856, 285 (Cordova).—SCLATER & SALVIN, Ibis, 1859, 13, 126 (Guatemala).—OWEN, Ibis, 1861, 61 (San Geronimo, Guat.; nesting in a bank).

? *Cotyle flavigastra*, SCLATER, P. Z. S. 1857, 212 (Orizaba).

Hab. Mexico and Guatemala.

(No. 30,716, ♂.) Above smoky brown, almost inappreciably lighter on the rump, darker on the head; quills and tail feathers smoky brown, the secondaries and greater coverts edged towards their ends with whitish. Chin and throat pale reddish fulvous, but in distinct contrast to the mouse gray of the breast, sides of body, and inside of wings. Rest of under parts white, with a faint trace of yellowish: the crissum pure white, the long feathers without brown tips, the shafts only faintly brownish towards the end. The feathers of axillars and inside of wings slightly edged with fulvous.

In young birds the wing coverts and quills above are broadly margined with reddish fulvous; the breast as well as the throat washed with the same.

(No. 30,716, ♂.) Total length, 5.00; wing, 4.20; tail, 2.20, depth, .20; length of bill from forehead, .40, from nostril, .20, along gape, .55, width, .45; tarsus, .40; middle toe and claw, .55, claw alone, .19; hind toe and claw, .35, claw alone, .16.

This species, originally established upon a young bird, appears perfectly distinct, and is intermediate in character between *serripennis* and *ruficollis*. The only adult I have seen is in autumnal plumage, and has a silky gloss that I have not noticed in spring specimens of *serripennis* (no autumnal ones being at hand for comparison). The color of the upper parts, back as well as wings, appears to be decidedly darker. The differences of the under parts consist in

the faintly rufous throat, contrasting, not uniform, with the mouse brown of the breast; this brown only extends over the front of the breast, instead of reaching to the belly, which is faintly yellowish, not dull white. The crissum is quite the same in both. Young birds of the two species are so similar that I cannot distinguish them by the color.

The species agrees with *ruficollis*, and differs from *uropygialis*, in the want of contrast of a pale rump and dark back. The size is decidedly less. It differs from both in much paler fulvous of throat, less amount of sulphur yellow on the belly, and the want of the dusky brown tips of the longer of the under tail coverts.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
?38,154	..	..	Orizaba, Mex.	...	M. Botteri.	.....
26,373	..	Juv.	Xalapa.	...	J. Krider.	D'Oca.
30,716	399	ad. ♂	Dueñas, Guat.	Oct. 17, '59.	O. Salvin.	Salvin & Godman.
35,096	405	Juv.	"	July 17, '59.	"	"

(35,096.) "Compared with type."

Stelgidopteryx uropygialis.

Cotyle uropygialis, LAWR. Ibis, April, 1863, 181.—IB. Ann. N. Y. Lyc. (Panama).

Cotyle flavigastra (VIEILL.), SCLATER, P. Z. S. 1860, 274 (Babahoyo, Ecuador).—*Cotyle ruficollis* (VIEILL.), SCLATER, P. Z. S. 1860, 292 (Esmeraldas, Ecuador)..

Hab. Isthmus Panama; southward along Andes.

(No. 157, ♂, type.) This species, if really distinct from *ruficollis*, resembles it very closely in most respects. It is, however, smaller, and the rump decidedly lighter, or pale grayish, in prominent contrast to the brown of the back. The rufous of the throat seems rather deeper, and the inside of wings darker.

A specimen (17,792) differs in having the wings longer and more pointed, measuring 4.45, the extreme difference between tips of primaries 2.15, the tail 2.30. It may, however, be that the wing of the type is not fully grown.

(No. 157.) Total length, 5.10; wing, 4.15; tail, 2.40, fork, .18; difference of primaries, 1.96; length of bill from forehead, .41, from nostril, .20, along gape, .55, width, .40; tarsus, .39; middle toe and claw, .52, claw alone, .18; hind toe and claw, .35, claw alone, .14.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
17,792	175	..	Isthmus Darien.	...	Lt. Michler.	A. Schott.
..	157	♂	Panama.	...	Cab. Lawrence.	M'Lean. & Galb.

(157.) Type.

Stelgidopteryx fulvigula.

Stelgidopteryx fulvigula, BAIRD, n. s.

Hab. Costa Rica.

(No. 34,677, ♂, Costa Rica.) Above smoky brown. Quills and tail feathers almost or quite black; rump with the feathers gray, edged with whitish, forming a conspicuous contrast to the back. Chin, throat, and forepart of breast reddish fulvous; sides under the wings brown, with a decided wash of fulvous; axillars and inside of wings smoky brown; rest of under parts dull white, with perhaps a tinge of yellowish; crissum pure white, in one specimen with a trace of a dusky spot at ends of longer feathers.

The edges of the feathers of upper parts, especially of the wing coverts and secondary quills, are tinged with reddish fulvous, indicating immaturity, as does also the absence of the hooks on outer web of first primary. Judging from the analogy of other species, these edgings probably disappear entirely in full dress.

(No. 34,677, ♂.) Total length, 4.50; wing, 3.60; tail, 2.00, its fork, .12; difference of primaries, 1.50; length of bill from forehead, .39, from nostril, .20, along gape, .49; gape, .40; tarsus, .38; middle toe and claw, .50, claw alone, .16; hind toe and claw, .33, claw alone, .12.

The very conspicuous light rump will readily distinguish this species from all its allies, except *uropygialis*. It is, however, considerably smaller than that species and much darker above, especially on quills and tail feathers (on both surfaces and including the shafts), the light rump more conspicuous. The fulvous red of throat seems to extend further on the breast, the white of the belly to extend farther forward, the brown of the sides to be more restricted. The under coverts lack the conspicuous dusky band at tips of larger feathers. The conspicuous wash of reddish fulvous on the side may be from immaturity.

It is barely possible that this may be the immature state of *S. uropygialis;* but the differences in size and coloration appear of specific value and not dependent on age.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,677	..	O. ♂	Angostura, C. R.	June 6, '64.	J. Carmiol.	.....
34,678	..	O. ♂	"	"	"	.....
34,679	..	O. ♀	"	Aug. 7, '64.	"	.....

(34,677.) Type.

COTYLE, BOIE.

Cotyle, BOIE, Isis, 1822, 550. (Type *Hirundo riparia*, L.)

Bill small; nostrils lateral, overhung by a straight-edged membrane. Tarsus about equal to middle toe without claw; feathered at upper end, especially

on inner face, and having also a small tuft of feathers attached to posterior edge near the hind toe. Middle toe with basal joint adherent externally to near the end, half way internally, the claws comparatively little curved, the lateral reaching beyond the base of middle. Tail slightly forked. Color dull lustreless brown above, in *riparia* white beneath with gray pectoral band.

Many American birds have been referred to *Cotyle*, but the only one really belonging to the genus is the cosmopolitan *C. riparia.* The peculiarity of the genus consists essentially in the tuft of tarsal feathers at the base of the hind toe, and the unusual length of the lateral claws, combined with the lateral nostrils overhung by membrane.

Cotyle riparia.

Hirundo riparia, LINN. S. N. I, 1766, 344.—WILS. V, pl. 38.—AUD. Orn. Biog. IV, pl. 385.—IB. B. Am. I, pl. 50.—LEMBEYE, Aves de Cuba, 1850, 47, lam. vii, fig. 3.—JONES, Nat. Hist. Bermuda, 34 (occasional, Aug. and Sept.)—*Cotyle riparia*, BOIE, Isis, 1822, 550.—CASSIN.—BREWER, N. A. Ool. I, 1857, 105, pl. iv, fig. 49 (eggs).—CAB. Jour. 1856, 4 (Cuba).—IB. 1861, 93 (Costa Rica (?)).—GUNDLACH, Cab. Jour. 1861, 330 (very rare in Cuba).—MARCH, Pr. A. N. Sc. 1863, 297 (Jamaica; very rare).—HEERMANN, P. R. R. X, 36 (California; abundant?).

Hirundo cinerea, VIEILL. Nouv. Dict. XIV, 1817, 526.

Hirundo riparia americana, MAX. Cab. Jour. VI, 1858, 101.

Hab. The whole of North America; Bermudas; Greater Antilles; Costa Rica? Also found in northern parts of the old world.

A careful comparison of the European specimens in the Smithsonian collection with American does not furnish any tangible grounds for separation; although the former, on the whole, appear to have longer wings, and more deeply forked tail with narrower feathers.

Specimens are in the collection from many localities throughout eastern and middle provinces of United States. Only one specimen from western province, and this is somewhat doubtful.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,030	..	♂	? Sacramento, Cal.	...	Lt. Williamson.	Dr. Heermann.
20,641	102	..	Hannaby River.	June 9, '60	C. Drexler.	.....
22,668	511	..	Fort Simpson.	1861.	R. R. Ross.	.....
23,219	..	..	Fort Good Hope.	...	R. R. McFarlane.	.....
31,126	..	..	Big Island.	...	J. Reed.	.....
..	..	..	Fort Youkon.	...	R. Kennicott.	.....
19,213	64	♀	Wind River.	May 26, '60	Capt. Raynolds.	Dr. Hayden.

(6,030.) Is the locality correct?

The following references to American Swallows I have not succeeded in identifying :—

Hirundo unalaschkensis, GMELIN, Syst. Nat. I, 1788, 1025. "Nigra; subtus cinerea; uropygio exalbido, rectricibus marginibus rotundatis. Long. 4½ unc. *Hab.* Unalaschka."

Hirundo andecola, D'ORB. et LAFR. Mag. de Zool. 1837. "Affinis precedenti (*H. patagonica*) magnitudine et forma rostri sed differt alis longioribus, cauda fere recta et coloribus. Supra nigra, colore viridi-nitens, alis caudaque vix emarginata nigro-fuscis, rectricibus lateralibus tres lineas tantummodo intermediis longioribus. Subtus gutture colloque plumbeis, pectore hypochondriisque cinerascentibus, abdomine medio anoque sordide albiscentibus, tectricibus caudæ inferis griseo maculatis. Long. 14 cent. *Habit.* in Andibus, La Paz, Bolivia."

This species appears related to *Atticora murina* or *cinerea*, but does not seem exactly the same.

Hirundo maculosa, KUHL (based on BUFFON, Pl. enl. 546, 1). Above lustreless brown; beneath white, with oval brown spots, closest anteriorly, more separated towards the tail. *Hab.* Cayenne.

The three strictly dentirostral families of Oscine birds which still remain for consideration—the *Vireonidæ*, *Ampelidæ*, and *Laniadæ*—differ from those just described in certain common characters. The bill is usually stouter and more hooked, in some forms excessively so, with a deep notch and sometimes a prominent tooth behind it; the tip of the lower mandible is also more or less notched. The nostrils are lateral, the bristles of the mouth generally well developed. Except in a few species of *Vireo* and in *Ampelis*, there are ten distinct primaries, the outer from one-fourth to one-half the second. The tail is sometimes short and square, sometimes long and graduated. The tarsus is always scutellate[1] anteriorly, and exhibits a tendency to subdivision in the lateral plates, very unusual in the families already considered. The basal joints of the toes are also more adherent than in the preceding: sometimes attached throughout, sometimes more free, much as in *Troglodytidæ*. From the typical *Turdidæ* they will be known by the scutellate tarsi, from all of the family by the greater adhesion of toes, and peculiar bill; from the *Troglodytidæ* by the notch and hook of bill and other characters. The only form resembling *Sylvicolidæ* (*Hylophilus*) has ten primaries and a more notched bill, as well as more united toes and very large claws.

While in the characters referred to, the three families differ from those previously under review, their precise limitation among themselves has been a subject of much difficulty. The proper position of *Dulus*, especially, has been a matter of considerable doubt, although it seems more properly placed among the *Ampelidæ*, being removed from the *Vireonidæ* on account of its less adherent toes, longer basal phalanges of anterior toes, wider gape, etc. In various respects, too, *Ampelis* can hardly be combined with *Ptilogonys*, as has been done. It may also be a question whether if *Ampelis* be united into the same family with *Ptilogonys* and its allies, *Collurio* may not be appropriately added to it. The *Myiadestes* group of what has usually formed the subfamily of *Ptilogonatinæ*, differs in the longer tarsi, with undivided plates, more deeply cleft toes, etc., from *Ptilogonys*, and should more properly be approximated to the *Turdidæ*, as will hereafter be explained.

The following characters will serve to illustrate the peculiarities of the three families:—

[1] Except in *Myiadestinæ*, which really belong with, or at least near, the *Turdidæ*.

Basal phalanx of anterior toes abbreviated; that of median toe decidedly shorter than the basal of inner, or the two basal of outer, and adherent for its whole length on both sides to the lateral (*i. e.*, not free at all). Lateral plates of tarsus undivided, except at extreme lower end.

Vireonidæ. Gonys more than half the length of lower jaw (from tip to angle of mouth), usually longer than width of mouth, which is narrow. Bill conical, much compressed, decurved at end and notched, but scarcely toothed. Frontal feathers bristly and erect, or bent but slightly forward. Nostrils overhung by membrane. Tarsus longer than middle toe and claw. Lateral toes generally unequal; outer claw reaching half way along middle claw.

Basal phalanx of middle toe about as long as the basal of inner, or the two basal of outer; free externally, at least for about one-third its length, internally for about one-half. Lateral plates of tarsus with decided tendency to subdivision (except in *Myiadestinæ*).

Ampelidæ. Gonys decidedly less than half the length of lower jaw, or than width of mouth, which is very broad and deeply cleft. Bill triangular, much depressed, decurved at end and notched, with moderate though decided tooth. Frontal feathers rather soft, scarcely bristly nor erect. Nostrils overhung by membrane. Tarsus equal to or shorter than middle toe and claw. Lateral toes nearly equal; outer claw reaching only to base of middle claw.

Laniidæ. Gonys about half length of lower jaw; about equal to width of mouth. Bill very powerful and raptorial, much compressed, with a strongly marked hook, notch, and tooth at end. Frontal feathers very bristly, and directed forwards, so as to conceal nostrils and base of bill. Nostrils with bony walls, except behind. Tarsus longer than middle toe and claw, sometimes much scutellate on sides. Lateral claws nearly equal; outer claw reaching a little beyond base of middle claw.

Family VIREONIDÆ.

The essential features of this family appear to consist in the combination of the dentirostral bill, notched in both mandibles; the ten primaries (except *Vireosylvia*), of which the outer is usually from one-fourth to one-half the second; the rather short, nearly even tail, with narrow feathers, and the great amount of adhesion of the anterior toes—the whole basal joint of the middle being generally united on both sides to the adjacent joints, and decidedly shorter than the basal of inner or two basal of outer. The outer lateral toe is generally appreciably longer than the inner, reaching considerably beyond the base of the middle claw. The tarsi are always distinctly

scutellate anteriorly. The young are never spotted, nor streaked as in the Thrushes; nor indeed do the adults exhibit such markings.

In the adhesion of the toes at their bases there is some resemblance to the *Troglodytidæ*, but their structure is different. In the latter family the joints are lengthened, the basal of the middle, about as long as the 1st and 2d of the outer, and equal to or a little longer than the basal inner. In *Vireonidæ* the basal joints are abbreviated; the basal of the middle equal to about one and a half joints of the outer, and not quite as long as the basal inner. This difference is, perhaps, related to the more or less terrestrial habitat of the one, and the strictly arboreal of the other. In *Vireonidæ*, too, there is a greater tendency to having three rows of scales on the upper part of the palm, on the three toes respectively, instead of having the outer two rows united more into a single series.

The young of *Vireonidæ*, before the first full moult—at least those of *Vireo*, *Vireosylvia*, and *Hylophilus*—are not spotted as in *Turdidæ* and *Myiadestes*, but closely resemble the adult.

The *Vireonidæ* are peculiar to the New World, and are generally distributed. *Laletes* and some species of *Vireo* and *Vireosylvia* are peculiar to the islands; *Hylophilus* extends to Trinidad and Tobago; the other genera are confined to the Continent.

The following synopsis of the genera may serve to facilitate their determination—the primary division being based on the character of the toes:—

Legs slender; claws weak; lateral toes unequal; the inner claw reaching about to the base of middle one, the outer nearly half way towards its tip.
  Bill slender; culmen straight, at least for basal half; quite abruptly and considerably decurved at the end.
    Wings pointed, considerably longer than the nearly even tail; spurious quill either wanting or very short, not one-third the second . . . *Vireosylvia*.
    Wings rounded, rather longer than the more or less rounded tail; spurious quill lengthened, one-third or more the second; second generally, and third almost always longer than secondaries; third or fourth quill usually longest. Bill rather compressed . . . *Vireo*.
    Wings much graduated, shorter than the considerably rounded tail; the sixth quill longest; second quill much shorter than secondaries; third scarcely longer. Bill short, more depressed, and broader between angles of mouth than in *Vireo* . . . . . *Neochloe*.

Bill stout, deep, much compressed, somewhat resembling *Cyclorhis*.

Wings pointed, although first quill is about two-fifths second, which about equals secondaries: the fifth longest; claws stouter than *Vireosylvia*, although proportions much the same. Bill with fine longitudinal furrows . . . . *Laletes*.

Legs stouter; claws large and strong; the lateral toes nearly equal; the claws of both reaching nearly to or beyond the middle of the central claw. Hind toe lengthened. First quill about half the second, which usually equals secondaries; fourth generally longest.

Bill slender, as in *Vireo*, but more conical, the culmen straighter, not convex at end, and but little decurved.

Wings about equal to the somewhat rounded tail . *Hylophilus*.

Bill very stout and Shrike-like . . . . . *Cyclorhis*.

Bill rather more slender than in last . . . . *Vireolanius*.

Having thus presented the characters of the genera of *Vireonidæ*, before taking them up in detail I propose to present some general views in regard to the typical members of the family, or *Vireosylvia* and *Vireo*, the true Vireones. Few groups of American birds, of the same extent, exhibit such diversities of form, there being scarcely any two that agree closely in the shape and proportions of the wings, tail, feet, &c., while the larger number stand isolated and single in their minuter peculiarities of external anatomy.

The colors, however, are very uniform; the upper parts being olivaceous or ashy, the under white, varied with yellowish; the face variously striped; the wings with or without light bars across the coverts, and light edgings on the secondaries; the tail feathers unspotted. The iris in many species is red, yellow, or white; the bill horn color or plumbeous; the legs always dusky. In one species (*atricapillus*) the head above is black; in *josephæ* it is dark brown.

In view of the great variations of form in the different species, and their gradual transition from one character to the other, there would be but little violence done by considering all as belonging to the single genus *Vireo*. Those, however, with long-pointed wings and short even tail, with very small spurious primary or none, may perhaps be conveniently separated, as *Vireosylvia* from *Vireo*, the former to include *Vireosylvia* proper, with its slender body and straight, rather weak bill, and *Lanivireo*, with its stouter form, thick, curved, and powerful bill and stronger feet, like a miniature Shrike. The gradation from one species to the other of *Vireo*, as

restricted, is so slight, while those agreeing in one or other feature differ so much in the remaining points of structure, that it is almost impossible to group them satisfactorily, and we can only make a few arbitrary sections of no great sharpness of definition, to aid in identifying the species—one of them *Vireo* proper, with longer, more pointed wings; the other *Vireonella* (Baird), with the wings shorter and more rounded.[1]

The following synopsis is intended to show the characters of the higher divisions of the group just referred to :—

VIREOSYLVIA. Wings long and pointed, one-third or one-fourth longer than the nearly even or slightly rounded tail. First quill very small (less than one-third the second), sometimes apparently wanting. Second quill longer than the seventh, much longer than the secondaries. Tarsi short (scarcely exceeding .70 of an inch); toes rather long.

Vireosylvia. Body slender and elongated. Bill slender, narrow, straight; the culmen straight for its basal half, the commissure quite straight; light horn color, paler beneath. Feet weak. Type *V. olivaceus*. Species *V. olivacea, flavoviridis, campestris, barbatula, agilis, chivi, philadelphica, gilva, swainsoni, josephæ*.

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[1] Allusion has already been made, on page 160 of the present work, to the possibility of detecting a rudimentary primary in nearly or quite all the Oscines which seem to have but nine. While the apparent presence or absence of this outer quill is sometimes useful in characterizing genera or even families, in *Vireosylvia* it is only of specific importance—the difference being merely one of development and position of the quill. In *V. flavifrons*, in which this outer primary is supposed to be wanting, its presence may easily be appreciated. One of the peculiar characters of this species consists in a narrow edging of white to all the primary quills, while the primary coverts (the small feathers covering their bases, as distinguished from what are usually termed the wing coverts, which more properly belong to the forearm or secondaries) are without them. If these coverts are carefully pushed aside, two small feathers, considerably shorter than the others will be disclosed, one overlying the other, which (the subjacent one) springs from the base of the exposed portion of the long outermost primary, and lies immediately against the outer edge. This small subjacent feather is stiff, falcate, and edged with white like the other quills, and can be brought partly round on the inner edge of the large primary, when it will look like any spurious quill. The overlying feather is soft, and without light edge.

In the other *Vireos* with appreciable spurious or short outer primary, a similar examination will reveal only one small feather at the outer side of the base of the exterior large primary. In all the families of Passeres where the existence of nine primaries is supposed to be characteristic, I have invariably found, as far as my examinations have extended, that there were two of the small feathers referred to, while in those of ten primaries but one could be detected.

Lanivireo. Body stout; head broad. Bill short and stout, broad at base, the culmen curved from the base, the commissure considerably arched. Bill blue black. Feet stout. Type *V. flavifrons.* Species *V. flavifrons, solitarius, propinquus, plumbeus.*

VIREO. Wings short and rounded, a little longer than the tail, equal to it, or shorter. First primary distinct and large, from two-fifths to half or more the length of the second, shorter or not longer than the eighth.

Vireo. Wings pointed; first quill less than half the second, which is about equal to seventh or eighth, and decidedly longer than the tenth primary and the secondaries. Type *V. noveboracensis.* The species coming under this section are *noveboracensis, carmioli, atricapillus, huttoni, belli, vicinior,*[1] and *pusilla.*

Vireonella. Wings rounded, scarcely longer than the tail; the first quill half as long as the second (or more than half), which is not longer than the tenth primary and secondaries, or even less. Bill and feet generally much stouter than the preceding. Type *V. gundlachi.* The species belonging here are *modestus,*[2] *latimeri, pallens, ochraceus, crassirostris, gundlachi,* and *hypochryseus.*

The Vireones are found throughout the New World, both to the extreme north and south, each section having peculiar forms. None of the North American species are ever met with in the West Indies, excepting *V. olivaceus, solitarius, flavifrons,* and *noveboracensis,* in Cuba, where they are extremely rare, and occur only as stragglers. They, however, penetrate on the Continent far to the south, in winter, some even reaching Bogota.

VIREOSYLVIA, Bon.

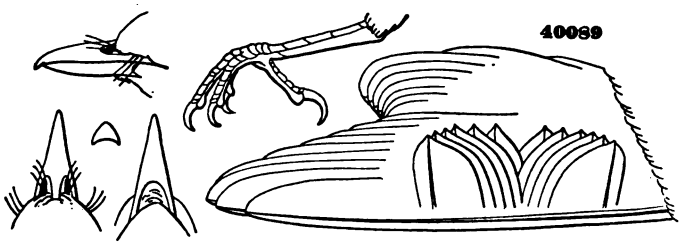
Vireosylvia, Bon. Geog. Comp. List, 1838. (Type *Muscicapa olivacea,* Lin.)
Phyllomanes, Cab. Arch. Nat. 1847, I, 321. (No type mentioned; name proposed as substitute for *Vireosylvia.*)

Wings pointed, longer than the tail, which is nearly even, or very slightly rounded. First primary (as in the type), wanting apparently in some species. Bill elongated, about as broad as deep at base, then becoming more and more compressed; the commissure and culmen nearly straight to the abruptly decurved and hooked tip. Both mandibles with distinct notch, the lower also slightly hooked. Nostrils open, oval, in lower edge of cavity, with membrane above and behind; the frontal feathers advanced and reaching nearly to posterior edge. Bristles in frontal feathers and in rictus to moderate extent. Legs in type rather short and weak; tarsus but little longer than middle toe

[1] *V. vicinior* has the first quill half or rather more than half the second, but otherwise falls within the limits of the present section.

[2] *V. modestus* in very small bill and other characters belongs very near *V. huttoni* of the preceding section, although its short wing brings it under the present one.

and claw, with seven well-marked scutellæ anteriorly. Outer lateral toe the longer, reaching beyond base of middle; claws much curved, compressed,



Vireosylvia olivacea.[1]

acute. In the dried specimen entire basal joint of middle toe adherent to one and three-fourths joints of outer, and the whole basal joint of inner; the adhesion externally extending indeed a little over the second joint of middle toe.[2]

VIREOSYLVIA, Bon.

The following synopsis expresses the characters of the species of *Vireosylvia* as restricted :—

COMMON CHARACTERS.—All species olive above, white or yellowish beneath. An ashy or brownish cap, contrasting more or less abruptly with the olive back. A whitish superciliary stripe extending to the nape, and a dusky one to and behind the eye. No light bands on the coverts. Inside of wings (flanks sometimes) and crissum yellowish, otherwise usually white beneath.

A. Bill lengthened; gape or commissure less than twice the distance from nostril to end of bill. No spurious primary.
Cap ashy, in contrast with olive green of back, edged with dusky, forming a faint supra-ocular dark stripe. A dusky stripe on each side of the chin.
Superciliary stripe and cheeks, especially anterior to the eye, and the chin tinged with brownish-buff. Ash of head indistinctly defined, owing to a wash of olivaceous. Olive of

[1] In the following figures the left foot is always given, and from the outer side.

[2] In the fresh bird the whole of the basal joint of the inner toe is adherent to the first phalanx of the middle, the membrane reaching a very little above the distal end of the latter. The basal joint of the outer, and more than half of the second joint are likewise adherent to the middle toe, the membrane extending to the middle of the second joint. The basal joints are thus united into a palm, not cleft at all. The upper surfaces of this palm are covered with hexagonal, not quadrangular scales, arranged in a connected pavement in three series. When the toes are extended, the hinder reaches to a point intermediate between the slightly unequal lateral toes, and nearly to the middle of the claw of the central toe.

back tinged with brown, and a wash of olive across the breast . . . . . *calidris.*

Superciliary stripe and cheek grayish-white, without any buff. Breast and chin quite pure white. Olive of back clear and pure; the ash of head well defined, and with little or no tinge of olive . . . . . *barbatula.*

Cap distinctly ashy, in decided contrast with the olive back. No stripe on each side the chin.

Outer quill about equal to, or very little shorter than the fourth. Second longest. Wing three inches long.

Dusky edge of ashy cap very distinct. Sides but slightly olivaceous. Crissum and axillars faintly yellowish. Inner edge of quills white. Concealed portion of tail feathers wood brown. Bill and feet pale brown . . . *olivacea.*

Outer quill about midway between fourth and fifth. Second usually longest. Wing three inches long.

Dusky edge of cap and whitish superciliary line indistinct. Sides from neck broadly olive yellow. Crissum and axillars deep sulphur yellow. Concealed portion of tail feathers olive green. Inner edge of quills yellowish . . . . . *flavoviridis.*

Outer quill shorter than fifth, midway between fifth and sixth. Third quill longest. Wing not exceeding 2.80 inches. Dusky edge of cap very distinct. Concealed portion of tail feathers olive green.

Sides broadly olivaceous. Crissum and axillars sulphur yellow, less than in *flavoviridis*. Length about 5.50. Wing 2.80 . . . . . *agilis.*

Color of sides and crissum less intense. Size much smaller. Length 5.00. Wing 2.50. Tail feathers narrow . *chiri.*

B. Bill short, weak; gape more than twice the distance from nostril to end of bill. With spurious primary, except in *philadelphicus*. Cap not edged with dusky.

No spurious primary. Cap ashy. Back olive. Under parts sulphur yellow, paler on chin and abdomen. Second primary rather shorter than the sixth . *philadelphica.*

A short spurious primary, less than one-third the second quill. Beneath white. Cap ashy. Back olivaceous ash.

Second primary about equal to sixth, or longer . *gilva.*
Second primary about equal to seventh. Bill much depressed . . . . . *swainsoni.*
Spurious primary longer, rather more than one-third the second quill. Cap brown. Back olive. Chin and throat white; rest of under parts sulphur yellow.
Second primary about equal to seventh . . *josephæ.*

Vireosylvia calidris.

? *Motacilla calidris*, Linn. Syst. Nat. 10th ed. 1758, 184; 12th ed. I, 1766, 329 (based on Edwards, tab. 121, fig. 2 (Jamaica).—*Vireosylvia calidris*, Baird.

? *Muscicapa olivacea*, Linn. S. N. I, 1766, 327 (*Muscicapa olivacea*, Edwards, tab. 253, Jamaica).

? *Vireo virens*, Bodd. Tabl. Pl. enl. 1782 (based on Pl. enl. 273, fig. 1, Merle de St. Domingue).

? *Turdus hispaniolensis*, Gm. Syst. Nat. I, 1788, 822 (based on *Merula olivacea dominicensis*, Brisson, II, 296, St. Domingo).

Muscicapa altiloqua, Vieill. Ois. Am. Sept. I, 1807, 67, pl. 31 (St. Domingo).—*Vireo altiloqua*, Gray, Genera.—Sallé, P. Z. S. 1857, 231 (St. Domingo).—March, Pr. A. N. Sc. 1863, 294 (Jamaica; eggs).—*Vireosylvia altiloqua*, Bon. Consp. 1850, 330.—A. & E. Newton, Ibis, 1859, 149 (Santa Cruz; eggs).—Lawr. Ann. N. Y. Lyc. VIII, 1864, 99 (Sombrero).—? ? Sclater & Salvin, P. Z. S. 1864, 348 (Isthmus Panama!).—Cassin, Pr. A. N. Sc. 1860, 375 (St. Thomas).—Sclater, P. Z. S. 1861, 72 (Jamaica).—Ib. Catal. 1861, 43, no. 262.

Vireo longirostris, Swainson, F. B. A. II, 1831, 237 (Jamaica).

Phyllomanes mystacalis, Cab. Wieg. Arch. 1847; Orn. Not. II, 348 (West Indies).

Vireosylvia olivacea, Gosse, Birds Jamaica, 1847, 194.

Vireosylvia atripennis, Lawrence, Pr. A. N. Sc. 1863, 106 (Sombrero).

Hab. Jamaica, St. Domingo, Porto Rico, St. Thomas, Santa Cruz, and Sombrero.

(No. 23,324, ♂.) Second and 3d quills equal, then 4th, the 1st intermediate between 4th and 5th, but nearer the former.

Top of head dull ash color, the rest of upper parts olive green (also tinging the ash of head), washed very slightly with brownish; pure olivaceous only towards rump, and on the edges of quills and tail feathers; the outer edges of greater secondary wing coverts more yellowish. Beneath white, tinged with greenish-yellow, the sides olivaceous, with a decided tinge of the same across the breast; the crissum, axillars, and edges of the inner wing coverts greenish-yellow. Inner edges of the primary quills nearly white, of the secondaries and of the tail feathers olivaceous-yellowish.

A broad pale stripe from nostrils over the eye to nape, anteriorly tinged strongly with buff; a dusky stripe from commissure through the eye, and a

still darker narrow line each side the chin along lower edge of under mandible, the space between this stripe and the one through the eye like the supra-ocular stripe, and like it, tinged anteriorly with buff; a decided indication of this color seen also on the chin.

The ashy cap is so much overlaid with olivaceous as to be scarcely perceptible, and without distinct outline; the outer edge is dusky as in *V. olivaceus*, but almost inappreciable. The primary quills are dark brown.

(No. 23,958, ♂.) Total length, 5.50; wing, 3.25; tail, 2.50; difference of exposed portion of 1st and 2d primary, .20; difference of 5th and 2d, .30; length of bill from forehead, .85, from nostril, .47, along gape, .90; tarsus, .75; middle toe and claw, .60, claw alone, .20; hind toe and claw, .47, claw alone, .22.

The quills in all the Jamaican specimens before me show great constancy in proportions, the second and third about equal, the former if anything slightly longer; the fourth next, the first (or outer) nearly midway between the fourth and fifth, sometimes a little nearer the latter. The same formula prevails in St. Croix and one Sombrero skin; in a St. Thomas specimen the first quill is but little longer than the fifth, in this respect more like the average of Cuban and Bahaman birds.

The coloration as above described varies somewhat in other specimens, the buff wash on sides of head and chin being sometimes more decided, sometimes less so, but always appreciable.

Messrs. Sclater & Salvin (P. Z. S. 1864, 348) refer to a specimen of "*V. altiloqua*" from the Isthmus of Panama. May not this be the *V. frenata* of Dubus, from Ocaña, New Grenada?[1]

Vireosylvia atripennis, of Mr. Lawrence, from Sombrero island, differs in blacker quills and tail feathers, a dusky tinge on top of head, and to a less degree beneath, as also on the inner edges of quills and tail feathers.

After a careful examination of the type specimen, however, I am unable to satisfy myself of its being really a distinct species. The quills and tail feathers are, it is true, darker than in *V. calidris*, but an investigation shows that to be due, in part at least, to a blackish foreign matter, partly deposited in grains, which can be rubbed off, and is removable to a considerable extent by benzine, but not by water. After washing the quills on one side in benzine, I found no

[1] An identification of *Vireosylvia frenata* of Dubus (Bulletin de Bruxelles, XXII, I, 1855, 150; Ocaña, N. Grenada), if truly of this genus, with either *V. calidris* or *barbatula*, can hardly be justified. From the description it would seem to be much less olivaceous above (yellowish-ash), the top of the head pure ash; the quills and tail feathers ashy brown, margined with yellowish, very different from the two species just mentioned; the length of 19½ centimetres, or more than 7½ inches, greatly exceeds their dimensions.

appreciable difference there from *V. calidris*, of Jamaica and St. Croix. The wing formula differs slightly in being 3. 2. 4. 5. 1. ; the outer quill being a little shorter than the fifth. A second specimen from Sombrero is undistinguishable in coloration from Jamaican skins, and has the 1st quill intermediate between the fourth and fifth.

In the absence of a larger number of specimens I cannot say what are the exact relationships of the St. Croix and St. Thomas birds to the Jamaican. The two before me I cannot in any way distinguish from some Jamaican skins, among which there is some variation. Specimens from Porto Rico and St. Domingo are also similar in general features. There is considerable variation in the size of bill in specimens from the same locality.

There can be little question that the figure of Edwards, upon which the name of Linnæus is based, refers to the Jamaican long-billed *Vireo*, although he does not satisfactorily express the color of the under parts. I have, therefore, restored *calidris* as the specific name.

The *Muscicapa olivacea*, of Linnæus, which has usually been considered to refer to the North American red-eyed *Vireo*, is based on pl. 253 of Edwards' Gleanings, which is unquestionably the Jamaican *Vireo* now under discussion. Linnæus, however, associates with it the figure of Catesby, I, tab. 54, which is the North American bird. The name of *M. calidris*, at any rate, takes precedence of *olivacea*, as occurring in the 10th edition.

Thirty specimens examined.

Smithsonian No	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,325	45	♂	Savannah le Mar,	Aug. 26, '58.	Dr. Sclater.	W. Osburn.
23,324	..	♂	Trelawney [Jam.	June 10, '59.	"	.....
38,050	53	♂	Spanishtown, Jam.	May, 1865.	W. Thos. March.	.....
38,048	53	♀	" "	"	"	.....
37,584	..	♂	Metcalfe Parish, "	April 2.	Prof. G. N. Allen.	.....
40,072	..	..	Jeremie, Hayti.	...	Prof. Agassiz.	P. R. Uhler.
5	..	..	"	...	"	"
39,349	..	..	Porto Rico, N. side.	...	Geo. Latimer.	.....
39,350	..	..	"	...	"	.....
39,351	..	..	"	...	R. Swift.	.....
..	..	..	Sombrero Island.	April 19, '64.	Cab. Lawrence.	A. A. Julien.
..	142	..	"	April 1, '64.	"	"
..	..	..	St Thomas.	...	" [ton.	.....
..	..	..	St. Croix.	1858.	Cab. A. & E. New-	.....

(.) Type of *V. atripennis*. (40,072.) From alcohol.

Vireosylvia barbatula.

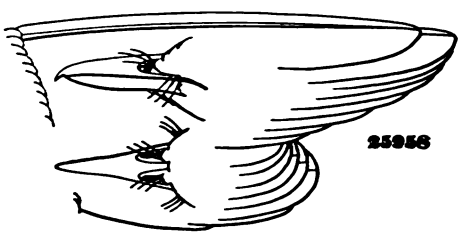
Phyllomanes barbatulus, CAB. Jour. III, 1855, 467 (Cuba).—GUNDLACH, Cab. Jour. 1861, 324 (Cuba).—IB. Repertorio, Cuba, 1865.

Vireo altiloquus, GAMBEL, Pr. A. N. Sc. 1848, 127 (Florida).—BAIRD, Birds N. Am. 1858, 354 (Florida).

Vireosylvia altiloqua, CASSIN, Pr. A. N. Sc. 1851, 152.—Ib. Illust. 1854, 8, and 221, pl. 37 (Florida).—BRYANT, Pr. Bost. Soc. V, 1859, 113 (Bahamas).—LAWRENCE, Ann. N. Y. Lyc. 1860 (Cuba).

Hab. Cuba; the Bahamas, and Charlotte Harbor, Florida. (W. Coast.)

(No. 259,58, ♂, Cuba.) Proportion of quills as in *V. calidris*, 2.=3. 4. 1. 5., but the tips of the quills closer together, and the 1st quill about half or a little less than half the distance between 5th and 4th; the quills narrower.



Vireosylvia barbatula. (Cuba.)

Colors similar to those of *V. calidris*, but of a purer and paler olive above; the back tinged with ash; the cap purer ash, and better defined, without olivaceous wash, its dusky edge more distinct. The superciliary stripe whitish, or grayish, with the cheeks paler, and both, as well as the chin, without the buff tinge. Under parts nearly pure white, very faintly tinged across the breast with ashy; the sides olivaceous; the crissum and axillars pale sulphur yellow.

(No. 25,958, ♂.) Total length, 5.50; wing, 3.15; tail, 2.50; difference of 1st and 2d quills, .18, of 5th and 2d, .22; length of bill from forehead, .82, from nostril, .46, along gape, .89; tarsus, .72; middle toe and claw, .60, claw alone, .21; hind toe and claw, .50, claw alone, .23.

The black-whiskered *Vireos* of Cuba, Bahamas, and Florida are distinguished by the characters just mentioned from the Jamaican species, and agree in coloration very well among themselves. While in *V. calidris* the first quill is, with scarcely an exception, about midway between the fourth and fifth, the second a little longer than the third, the tendency in the present series is to have the third quill rather the longer, and the first only equalling the fifth. Only in No. 17,711 and 25,958, from Cuba, and 34,513, from Nassau, is the first quill longer, or reaching nearly half way from the 5th to the 4th.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
25,956	..	..	Cuba.	...	Dr. Gundlach.	.....
33,064	..	..	"	...	"	.....
...	243	..	"	...	Cab. Lawrence.	Dr. Gundlach.
17,711	..	..	Monte Verde, Cuba.	May 6.	C. Wright.	... ..
13,505	..	..	Nassau, N. P	Dec. 8, '59.	Dr. Bryant.	.....
34,514	23	..	" [Fla.	May 14, '64	Lt.C. L. Fitzgerald.	.....
24,282	243	..	Charlotte Harbor,	June, 1848.	Dr. Heermann.	.....

Vireosylvia olivacea.

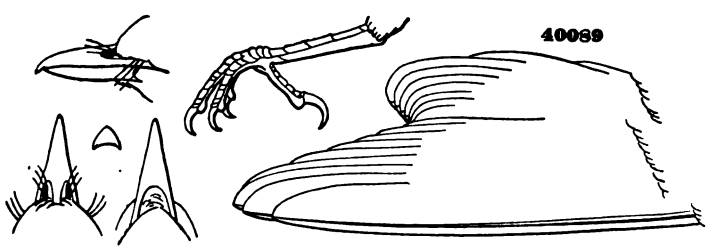
Muscicapa olivacea, LINN. S. N. I, 1766, 327 (based on EDWARDS, tab. 253, and CATESBY, pl. 54).—WILS. Am. Orn. II, 1810, 53, pl. xii, fig. 3.—*Lanius olivaceus*, LICHT. Verz. 1823, 49 (N. Amer.).—*Vireo olivaceus*, VIEILL., BON. Obs. Wils. 1826, 124.—SWAINS. F. B. A. II, 1831, 233.—AUD. Orn. Biog. II, pl. 150.—IB. B. A. IV, pl. 243.—BAIRD, Birds N. Am. 1858, 331.—*Vireosylvia oliv.* BON., Geog. Comp. List, 1838.—IB. Consp. 1850, 329.—REINHARDT, Vid. Med. f. 1853, 1854, 82 (Greenland).—IB. Ibis, III, 7.—SCLATER, P. Z. S. 1855, 151 (Bogota); 1859, 137, 363 (Xalapa).—IB. Catal. Am. Birds, 1861, 43, no. 261.—A. & E. NEWTON, Ibis, 1859, 145.—SCLATER & SALVIN, Ibis, 1859, 12 (Guatemala).—LAWRENCE, Ann. N. Y. Lyc. VII, 1860, 246 (Cuba).—Ibis, 1864, 394 (Derby, Engl. May, 1859).—*Phyllomanes oliv.* CAB. Mus. Hein. 1850–51, 63.—IB. Jour. 1860, 404 (Costa Rica).—GUNDL. Cab. Jour. 1861, 324 (Cuba; very rare).

? *Vireo virescens*, VIEILL. Ois. Am. Sept. I, 1807, 84, pl. liii (Penna.).—? GRAY, Genera, I, 267, pl. lxv.

Vireo bogotensis, BRYANT, Pr. Bost. Soc. VII, 1860, 227 (Bogota).—LAWRENCE, Ann. N. Y. Lyc. 1863 (Birds Panama, IV, No. 378).

Hab. Whole of Eastern North America (Halifax, Greenland, Fort Simpson), west to base of Rocky Mts., reaching Fort Bridger and still further northward to Bitterroot Mts. and Kootenay; south to Panama and Bogota, in winter (Xalapa only in Mexico); very rare in Cuba (only West Indian locality). Accidental in England.

(No. 1,418, ♂, Carlisle, Pa., May, 1844.) Upper parts olive green. Top of head, from bill to nape, ash color. A white line from nostrils above and beyond the eye, bordered above by a dusky line forming the edge of the ashy cap, and below by a similar, perhaps paler loral and post-ocular cheek stripe. Beneath, including tibiæ, white, with perhaps a tinge of olivaceous ash across the breast; the sides of neck like the back; sides of the body with a faint wash of olive. Axillars and crissum faintly tinged with sulphur yellow; lining of wings and its edge, the latter especially, nearly white. Quills blackish-



Vireosylvia olivacea.

brown, edged externally, except at ends of primaries, with olive, internally with white. Tail feathers lighter brown, edged externally like the back, internally with pale olivaceous-white.

Bill dusky above, pale below; tarsi plumbeous; iris red.

Female birds generally similar, but smaller.

(No. 1,415, ♀.) Fresh specimen: Total length, 6.33; expanse of wings, 10.25; wing from carpal joint, 3.33. Prepared specimen: Total length, 5.75; wing, 3.20; tail, 2.50; difference between 1st and 2d primaries, .17, of 5th and 2d, .10, of 9th and longest, .66; length of bill from forehead, .70, from nostril, .42, along gape, .65; tarsus, .77; middle toe and claw, .45, claw alone, .20; hind toe and claw, .45, claw alone, .21.

In No. 1,415 the second quill is longest, the third and fourth a little shorter; the first or outer a little less than the fourth, much longer than the fifth. In other specimens the first quill is longer than the fourth; generally, it may be said, that the first quill is always (or with rare exceptions) nearly equal to the fourth, sometimes a little longer, sometimes a little shorter; always much longer than the fifth, the second quill always longest of all.

There is some variation in color in this species, both individual and seasonal. In No. 34,081, ♀, from Iowa, the colors are purer and brighter; the ash of crown dark and clear, without the olivaceous wash so frequently met with. The dusky markings about the head are almost black, and there is almost no yellowish whatever on the crissum.

Autumnal and late summer specimens are much more brightly colored; the olive clearer, the gray of head more sharply defined, and the crissum and axillars with a strong tinge of yellowish. In only a single spring specimen out of twenty is there a positive, though still pale sulphur yellow crissum, all others showing this faintly or not at all. The most brightly colored autumnal skin in the series is No. 22,308 (Washington, October), in which the colors are nearly as vivid as in *V. chivi*, and perhaps answering to *V. virescens* of Vieillot.[1]

There is considerable difference in thickness, and some in the length

[1] In the article on *Vireonidæ*, in the Pacific R. R. Report, page 333 (Birds N. America) I have given the name of *V. virescens*, Vieillot, to the Bartramian *Vireo, V. agilis*. In this, however, I am now satisfied I was wrong. The specific name was based by Vieillot (Nouv. Dict. d'Hist. Nat. XXXVI, 1819, 104) on a bird killed in New Jersey. He describes the top of the head as "blackish;" the figure, however, distinctly represents a black line bordering the crown, and above the light supra-ocular stripe. The quills and tail feathers are said to be edged with greenish, the lower tail coverts to be yellowish, the length 4.60. Nothing is said about the proportions of the quills. In view of all the circumstances, locality, etc., it is very probable that this description belongs to a young, perhaps autumnal *V. olivacea*, a name apparently unknown to Vieillot. There is no indication in the description of the very bright colors of *V. chivi* or *agilis*, the olive being described as having a strong grayish tinge.

of bill. Young birds have considerably shorter bills, the colors less vivid, but otherwise similar to the adults.

I find no appreciable differences in specimens from Guatemala, Panama, and Bogota, either in size or other characters, which cannot be readily matched by northern skins.

The name of Linnæus, cited for this species, is based by him on pl. 253 of Edwards' Gleanings, and on pl. 54 of Catesby's Carolina; the former, however, and that first mentioned, being unquestionably the Jamaican *V. calidris*, while the latter refers to the subject of the present article. A strict adherence to the rule of priority may require the name "*olivaceus*," therefore, to be thrown aside, and some other, as "*virescens*," Vieill., adopted; but as Catesby's plate has priority of Edwards', we may perhaps consider the priority of quotation as neutralized, and leave "*olivaceus*" for the species. A similar question exists in reference to the proper specific name of the North American "*Mimus polyglottus*." I am not quite satisfied, however, that either of these names should be retained.

About one hundred and thirty specimens have been examined, from various localities throughout the whole eastern province of the United States.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
26,933	..	..	Halifax, N. S.	...	W. G. Winton.	.....
1,418	..	♂	Carlisle, Pa.	May 1, '44.	S. F. Baird.	.....
1,435	..	♂	"	May 3, '44.	"	.....
1,440	..	♀	"	"	"	.....
29,245	737	♂	Washington, D. C.	April 26, '60.	Dr. E. Coues.	.....
32,274	..	..	Liberty County, Ga.	...	Jos. Leconte.	.....
3,823	..	..	Eutaw, Ala.	...	Prof. Winchell.	.....
19,554	620	♀	Fort Resolution.	June 7.	R. Kennicott.	.....
22,678	509	..	Fort Simpson.	June 22, '60.	B. R. Ross.	.....
27,035	..	..	Selkirk Settlement.	...	Geo. M'Tavish.	.....
21,049	..	..	"	...	Donald Gunn.	.....
39,338	..	♀	Cook County, Ill.	June 9, '64.	R. Kennicott.	.....
24,287	..	..	Neosho Falls.	Summer.	B. F. Goss.	.....
34,358	318	♂	Republican Fork.	May 26, '64.	Dr. E. Coues.	.....
19,084	57	♀	Fort Cobb, Ark.	May 25, '60.	J. H. Clark.	.....
21,945	540	..	Pack River, W. T. Kootenay.	June 14, '60.	A. Campbell.	Dr. Kennerly.
22,043	96	..	Bitterroot Valley.	Sept. 4, '60.	Dr. J. G. Cooper.	.....
11,063	..	..	Fort Bridger.	Sept. 1, '57	C. Drexler.	.....
13,181	..	♀	Missouri River, 800 miles ab. St. Louis.	...	Lt. Mullan.	J. Pearsall.
3,4181	51	♂	Sioux City, Iowa.	May 20, '64.	Capt. J. Feilner.	.....
8,695	..	..	Fremont, Platte Riv.	...	Lt. Warren.	Dr. Hayden.
6,813	16	♂	Devil's River, Tex.	...	Col. Graham.	J. H. Clark.
6,814	..	..	Western Texas.	...	Capt. J. Pope.	.....
13,602	..	..	Guatemala.	...	J. Gould.	.....
..	163	..	"	...	Cab. Lawrence.	.....
33,298	..	..	San Jose, C. R.	...	J Carmiol.	.....
29,550	..	..	Costa Rica.	...	Berlin Mus.	.....
..	..	..	Panama R. R.	...	Cab. Lawrence.	M'Leannan.
32,290	..	..	Bogota.	...	G. N. Lawrence.	.....
34,623	..	..	"	...	J. H. Roome.	.....

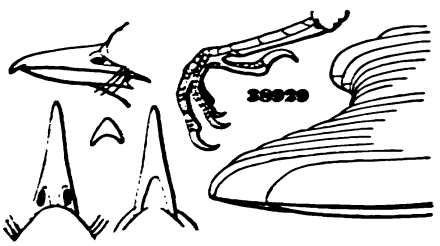
(21,945.) With eggs.

Vireosylvia flaviviridis.

Vireosylvia flav. CABANIS, Pr. A. N. Sc. V, Feb. 1851, 152.—Ic. VI, pl. ii (Panama).—SCLATER, P. Z. S. 1856, 298 (Cordova).—Ic. 1859, 375 (Oaxaca; April).—Ic. Catal. 1861, 44, no. 264.—SCLATER & SALVIN, Ibis, I, 1859 12 (Guatemala).—*Vireo flav.* BAIRD, Birds N. Am. 1858, 332.—*Phyllomanes flav.* CAB. Jour. 1861, 93 (Costa Rica).

Hab. From northern border of Mexico to Isthmus of Panama, especially on west side.

(No. 3,976, ♂.) Above olive green; the whole top of head and nape ash color, the edges of this cap, and a loral line dusky, but not very decidedly so. A grayish-white line from nostrils over the eye. Beneath white, the sides of the neck, breast, and body bright olivaceous-yellow; the axillars and crissum rich sulphur yellow. On the breast the yellow extends almost to the median line, the color of opposite sides separated by a narrow interval. Quills dusky brown; margined externally, except at ends of primaries, with olive green, internally with grayish-white of a decided yellow shade. Tail feathers dark olivaceous-brown, bright olive externally, internally olivaceous-yellow. Iris yellow or "red."



Vireosylvia flaviviridis. (Panama.)

Bill horn-color, paler below. Legs plumbeous. Wings long and pointed. Second and 3d quills nearly equal; 4th a little less; 1st about intermediate between 4th and 5th.

(No. 3,976.) Total length, 6.00; wing, 3.20; tail, 2.60; difference of 1st and 2d quills, .30, of 2d and 5th, .15, of 9th and longest, .70; length of bill from forehead, .70, from nostril, .45, along gape, .85; tarsus, .70; middle toe and claw, .58, claw alone, .14; hind toe and claw, .42, claw alone, .20.

Specimens appear to vary somewhat in intensity of coloration, size and shape of bill, and in dimensions, but little otherwise. The sexes are similar. The wing formula above mentioned is the prevalent, though in a few instances the first quill is about equal to or a very little less than the fifth.

This species is of about the size of *V. olivacea*, or a little larger; the tail longer proportionally, the wings shorter and much less pointed. The wing formula is much the same, but the difference of the shortest and longest primaries is about .70, instead of .90, as in *olivacea*. The bills are not dissimilar; the coloration, however, appreciably different. The dusky lines over and through the eye are much less vivid, the white one less distinct. The decided olive yellow of the entire side of body from neck to crissum, extending

beyond the closed wings and encroaching on the front part of the breast, is never seen in *olivacea*, where any olive is concealed. The crissum and axillars are much brighter yellow; the inner edges of the quills yellowish, not white. The tail feathers are decidedly olivaceous in their concealed portion, not clear brown; and the olivaceous of the back is much brighter and more yellow.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
3,976	172	♂	Monterey, Mex.	...	Lt. D. N. Couch.	.....
3,977	178	♂	"	...	"	.....
34,021	0	..	Mazatlan, Mex.	June 16, '62.	Col. A. J. Grayson.	.....
34,023	000	..	"	"	"	.....
34,024	0000	..	" [ma, Mex.	"	"	.....
23,787	151	..	Rosario, near Coli-	June, 1863.	J. Xantus.	.....
23,782	157	..	"	"	.....	.....
23,790	164	..	"	"	.....	.....
30,504	134	..	San Jose, C. R.	...	Dr. v. Frantzius.	.....
30,505	179	..	"	...	"	.....
33,296	133	..	"	...	"	.....
33,297	..	..	"	...	J. Carmiol.	.....
38,929	..	..	Isthmus Panama.	Jan. 25, '65.	F. Hicks.	.....
34,608	..	..	"	...	J. H. Roome.	.....
..	170	..	"	...	Cab. Lawrence.	.....
38,928	..	♂	Panama.	Jan. 12, '65.	F. Hicks.	.....

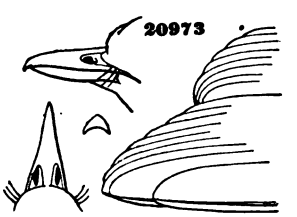
(3,976.) Eyes yellow. (38,929.) Eye red. (38,928.) Eye chocolate.

Vireosylvia chivi.

Sylvia chivi, VIEILL. Nouv. Dict. XI, 1817, 174 (based on AZARA, Contramæstre Gaviero, Apuntam. II, 34, no. 152).—IB. Encyclop. Méth. 1823, 437.

Hab. La Plata region; north to Bahia.

(No. 16,340, ♀.) General distribution of color the same as in *V. olivacea*. The concealed portion of tail feathers more olivaceous than brown. The inner edges of the quills pale olivaceous-yellow, of the rectrices brighter yellow. Sides of the body greenish-yellow. Axillars and crissum sulphur yellow. Superciliary dusky stripe deep and distinct. Bill plumbeous, dusky above, pale at the base below.



Vireosylvia chivi. (Vermejo Riv.)

Third quill longest; 2d and 4th very little shorter; 1st shorter than the 5th, nearly intermediate between it and the 6th.

(No. 16,340.) Total length, 4.95; wing, 2.45; tail, 2.10; width of lateral feather, .25; difference of 1st and 2d quills, .14, of 1st and 3d, .21, of 2d and 5th, .09, of 3d (longest) and 9th, .54; length of bill from forehead, .59, from nostril, .35, along gape, .67; tarsus, .65; middle toe and claw, .50, claw alone, .14; hind toe and claw, .43, claw alone, .15.

A male bird, No. 30,973, from the Vermejo, is of precisely the same size.

22 May, 1866.

In a pretty extensive series of specimens of South American *Vireos*, which have been referred to *V. chivi, agilis, bartramii*, etc. of authors, supposed to be synonyms of the same species, I find considerable differences which apparently indicate the presence of two or even three species, differing almost too much in size and coloration to be considered the same. I have therefore selected the specimens from Captain Page's Paraguay expedition as typical of the oldest name, *V. chivi*, based on Azara's descriptions. These specimens, two in number, agree with Azara's bird in the small size; the coloration is less intense than in the rest, the yellow of the under parts being not much brighter than in *olivaceus*, but as a spring plumage this is to be expected, if, as is probable, Azara's description was taken from autumnal birds.

The great inferiority in size to *V. olivaceus*, and the difference in the wing formula, will at once distinguish this species or race. The coloration of No. 16,340 is almost precisely that of No. 1,418, the type of the description of *V. olivaceus*, the olive being only a little deeper, the axillars brighter yellow.

If there are two species of South American *Vireos* of the *chivi* type, as suggested, the more southern appears to be the smaller and the northern one the larger, although not closely restricted. Thus a specimen in the collection labelled "Buenos Ayres," possibly erroneously, however, is as large as the largest, while two from Bahia are as small as the La Plata skins described.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,173?	..	..	Bahia, Brazil.	...	Dr. G. Cabanis.	.....
...	158	..	"	...	Cab. Lawrence.	.....
16,340	115	♀	Brazil.	Oct. 1859.	Capt. Page, Expl.	Chr. Wood.
20,973	37	♂	Vermejo River.	Feb. 1860.	" [of Parana.	"

Vireosylvia agilis.

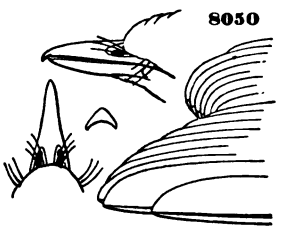
Lanius agilis, LICHT. Verz. Doubl. 1823, no. 526 (Bahia, Brazil).—? *Thamnophilus agilis*, SPIX, Av. Bras. II, tab. xxxiv, fig. 1.—*Phyllomanes agilis*, BURM. Th. Bras. Vögel, II, 1856, 108.—*Vireosylvia agilis*, SCLATER, P. Z. S. 1860, 64, 273 (Ecuador).—IB. Catal. 1861, 44, no. 263 (Bogota, etc.).

Vireo bartramii, SWAINSON, F. B. A. II, 1831, 235 (not of AUD.).

Vireosylvia virescens, CASSIN, Pr. A. N. Sc. 1851, 151.—SCLATER, P. Z. S. 1855, 151 (Bogota).—*Vireo virescens*, BAIRD, Birds N. Am. 1858, 333 (Brazil), not of VIEILL.

Hab. South America; south to Buenos Ayres, Ecuador, Guatemala.

(No. 2,034.) Similar to *V. olivacea* in olive of upper parts, lead colored cap edged with blackish, a whitish superciliary, and dusky loral stripe. Sides, however, more conspicuously olivaceous yellow; axillars and crissum purer yellow; inner edges of quills and tail feathers pale, but distinctly yellowish; rest of under parts greenish-white.



Vireosylvia agilis. (Guatemala.)

Third quill longest; 2d and 4th scarcely less; 1st intermediate between 5th and 6th.

(No. 2,034.) Total length, 5.50; wing, 2.80; tail, 2.35; width of outer feather, .30; difference of 1st and 3d primaries, .27, of 2d and 5th, .15, of 3d and 9th, .54; length of bill from forehead, .66, from nostril, .37, along gape, .77; tarsus, .70; middle toe and claw, .53; hind toe and claw, .44 (claw broken).

The ashy cap does not extend over the nape, and is rounded off behind, leaving the sides of occiput olive.

A specimen from Trinidad, belonging to Mr. A. Newton, differs in much brighter and deeper olive and yellow shades; the ash of cap extends farther back on the nape, but is rather rounded behind. The concealed portion of the tail feathers is almost as distinctly olive as the back. The wing is unusually long, measuring 2.95; the first quill is about equal to the fifth; the difference of shortest and longest quills .62.

Another specimen (No. 8,050, from Guatemala), which may possibly belong even to a different species, is equally bright in coloration with preceding, and the ash of cap extends still more over the nape, widening behind; the posterior outline almost transverse. The tail feathers are broader (.35); the wing shorter (2.75); the first quill intermediate between the fifth and sixth; the difference of longest and shortest quills .55. One from Ecuador, referred here, in poor condition, differs in some minor points. One from Buenos Ayres, again, is unusually large, the tail longer, the wing equal to the Trinidad specimen.

Compared with *V. chivi*, of the La Plata region, this species, as described above, is considerably larger, and in size nearer to *V. olivacea;* the wings are more pointed, the olive yellow and yellow of the sides and under parts brighter and more distinct.

From *V. olivacea* it differs in the much brighter coloration of the under parts, and in the wing formula, as well as in inferior size. In many points of coloration it bears a close resemblance to *V. flavoviridis*. It is, however, smaller and less brightly colored, and the olive yellow of the sides does not encroach so much on the breast. There is also an appreciable difference in the markings of the head,

the dusky edges of the cap, and the dark lateral line, relieved against a whitish superciliary stripe, so distinct in *olivaceus* and *agilis*, being scarcely or much less appreciable in *flavoviridis*. The wings are more rounded in *agilis*: the first quill considerably shorter than fifth, instead of being nearly equal or longer.

This species, whether what I describe as *V. chivi* be the same or not, scarcely extends north of Continental South America—the skin from Guatemala, just mentioned, being almost the only one quoted, and the locality of this may possibly be erroneous, even if the bird be not of a different species. I have never found any indication of the occurrence of any bird of this type in the West Indies or North America in recent times.[1]

It is quite probable that the careful comparison of a larger number of good specimens of *Vireos* of the type of *chivi* and *agilis* may result in establishing the existence of one or two more species; that from "Guatemala" (No. 3,060), at least, is different in several points from the rest, and I had provisionally named it before concluding that it was best to allow the decision of the question to rest upon the examination of a better series.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
10,174	..	♀	S. Brazil.	...	Dr. Cabanis.	.....
2,094	..	..	Brazil.	...	S. F. Baird.	Langsdorff.
15,074	..	..	Buenos Ayres.	...	J. K. Townsend.	.....
34,097	..	..	Cuyo, Ecuador.	...	Prof. Jameson.	.....
..	..	..	Trinidad.	...	Cab. J. & H. Newton.	.....
3,060	..	..	"Guatemala."	...	J. Gould.	.....

(3,060) "Perhaps erroneous locality."

Vireosylvia philadelphica.

Vireosylvia philadelphica, CASSIN, Pr. A. N. Sc. V, Feb. 1857. 153.—Ic. VI, pt. i, fig. 1 (Philadelphia).—SCLATER & SALVIN, Ibis, I. 1859,

[1] I have never met with a bird agreeing with the description of *Vireo bartramii*, of Audubon. The proportions of the body and the quills are much as in *V. agilis*. The tail, however, is said to be "wood-brown margined with paler," instead of olivaceous; and the lower parts "white, the breast tinged with pale yellow, and the throat and sides with gray," instead of being white below; the crissum bright sulphur yellow, the flanks yellowish-olive. The crown (not the nape) is "deep gray, bordered by a line of blackish," which separates it from all known North American species, excepting *V. olivaceus* and *barbatulus*, from which the proportions of the quills are entirely different.

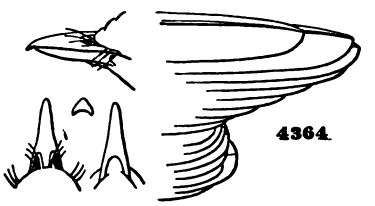
If, therefore, this species be really as described by Audubon, it has been entirely unnoticed since his time, although distinct, and should be carefully sought for by ornithologists in the Eastern United States.

12 (Guatemala).—*Vireo philadelphicus*, BAIRD, Birds N. Am. 1858, 335, pl. 78, fig. 3.

Vireosylvia cobanensis, SCLATER, P. Z. S. 1860, 463 (Coban).—IB. Ann. Mag. N. H. 1861, 328.

Hab. Eastern North America to Hudson's Bay and Maine, south to Costa Rica and Guatemala. Not recorded from Mexico or West Indies.

(No. 20,643, ♂.) Above dark olive green, tinged with plumbeous ash except on the rump; top of head and nape purer plumbeous ash, not edged with dusky, the line of demarcation indistinct. Beneath light sulphur yellow, paler and almost white on chin and middle of abdomen; sides more olivaceous. A whitish stripe from bill over eye, as also a patch beneath it and the eyelids; a dusky loral and post-ocular spot. Quills and rectrices brown, edged externally with olive, internally with whitish; the larger coverts with paler outer edges. Bill blackish, paler plumbeous below. Legs plumbeous. Spurious outer or first quill (seen in *gilva*) wanting; the outer about equal to 5th; 3d longest; 2d and 4th not much shorter.



Vireosylvia philadelphica.

(No. 20,643, ♂.) Total length, 4.80; wing, 2.65; tail, 2.25; difference between outer and longest primary, .28, of longest and innermost, .62; length of bill from forehead, .54, from nostril, .30, along gape, .61; tarsus, .65; middle toe and claw, .52; hind toe and claw, .44.

Specimens vary somewhat in purity of tints, and especially in intensity of yellow of under parts, which color is deeper in autumnal skins.

I regret that I led Mr. Sclater into an error by informing him that the *Vireo* subsequently described by him as *V. cobanensis* was different from *V. philadelphica*. The skin forwarded for examination by him appeared to differ in some noticeable points, but those subsequently received from Mr. Salvin and other sources agree exactly with specimens from Wisconsin and Hudson's Bay.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,643	79	..	Moose Factory, H.B.	June 2, '60.	C. Drexler.	.....
35,115	27	..	Waterville, Me.	May 21, '63.	Prof. C. E. Hamlin.	.....
4,364	..	..	Cleveland, O.	...	Dr. Kirtland.	.....
6,841	..	♂	Dane County, Wis.	...	Th. Kumlien.	.....
18,572	..	..	Coban, Guat.	...	Dr. Sclater.	.....
20,401	..	..	"	...	O. Salvin.	.....
..	171	..	Guatemala.	...	Cab. Lawrence.	.....
33,300	..	..	San Jose, C. R.	Jan. 12, '64.	J. Carmiol.	.....

(18,572.) Type of *V. cobanensis*. (33,300.) Iris brown.

Vireosylvia gilva.

Muscicapa gilva, VIEILL. Ois. I, 1807, 65, pl. xxxiv.—*Vireo gilvus*, BOS. Obs. Wils. 1825, no. 123.—AUD. Orn. Biog. II, pl. 118.—IB. Birds Am. IV, pl. 241.—BAIRD, Birds N. Am. 1858, 335.—*Vireosylvia gilva*, CASSIN, Pr. A. N. Sc. 1851, 153.—SCLATER, P. Z. S. 1856, 298 (Cordova); (?) 1858, 302 (Oaxaca; June) (perhaps *V. swainsoni*).
Muscicapa melodia, WILS. Am. Orn. V, 1812, 85, pl. xlii, fig. 2.

Hab. Eastern North America to Fort Simpson. Cordova and Oaxaca only southern localities recorded. Not West Indian.

(No. 1,017, ♀.) Above olive green, strongly glossed with ashy; the head and nape above more distinctly ashy, but without decided line of demarcation behind, and without dusky edge; rump purer olive. Stripe from nostrils over eye to nape, eyelids, and space below eye creamy white. A rather dusky post-ocular and loral spot, the latter not extending to the bill. Under parts white, with tinge of greenish-yellow (occasionally of creamy fulvous or buff), especially on breast; sides more olivaceous. Crissum and axillars scarcely more yellowish. Quills and rectrices wood brown, edged internally with whitish, externally with olivaceous, except perhaps on longer primaries. Edge of wing white. Larger wing coverts grayish-brown, with paler edges, and no trace of olivaceous. Bill horn color above, paler below.

Vireosylvia gilva. (Pennsylvania.)

First quill very short or spurious; 2d about equal to, generally rather longer than 6th; 3d longest; 4th, then 5th a little shorter.

(No. 1,017, ♀.) Fresh specimen: Total length, 5.33; expanse of wings, 8.35; wing from carpal joint, 2.85. Prepared specimen: Total length, 4.80; wing, 2.75; tail, 2.25; difference of 3d and 10th quills, .73; exposed portion of 1st primary, .58, of 2d, 1.88, of longest (measured from exposed base of 1st primary), 2.12; length of bill from forehead, .56, from nostril, .28, along gape, .63; depth of bill, .15; tarsus, .65; middle toe and claw, .51, claw alone, 17; hind toe and claw, .41, claw alone, .19.

The preceding description is from a female specimen which does not differ appreciably from the male, but is a little smaller Young and autumnal specimens are perhaps a little more brightly colored.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,016	..	♂	Carlisle, Pa.	May 24, '43.	S. F. Baird.	.....
1,017	..	♀	"	"	"	.....
10,115	..	♂	Washington.	...	J. C. M'Guire.	.....
29,275	784	♂	"	May 5, '60.	E. Coues.	.....
19,553	93	♂	Fort Simpson.	May 22, '60.	B. R. Ross.	.....
27,035	..	..	Selkirk Settlement.	...	Gov. Mactavish.	.....
4,729	..	♂	Missouri River.	May 9, '57.	Lt. Warren.	Dr. Hayden.
5,305	..	♀	Fort Lookout.	June 15, '56.	"	"
35,405	1,905	..	Evanston, Ill.	...	Chicago Acad.	F. J. Huse.
25,240	..	..	Cairo, Ill.	...	J. K. Townsend.	.....

Vireosylvia swainsoni.

Vireo swainsoni, BAIRD, Birds N. Am. 1858, 336 (Pacific coast).

Vireo bartramii, SWAINSON, F. B. A. II, 1831, 235 (in part; spec. from Columbia River?).

Hab. United States, from Rocky Mountains to Pacific coast.

(No. 5,321, ♂.) Similar to *V. gilva*, but smaller; colors paler. Bill more depressed. Upper mandible almost black. Second quill much shorter than 6th.

Vireosylvia swainsoni. (California.)

(No. 5,521, ♂.) Total length, 4.75; wing, 2.71; tail, 2.35; difference between 10th quill and longest, .58; exposed portion of 1st primary, .58, of 2d, 1.82, of longest (measured from exposed base of 1st primary), 2.10; length of bill from forehead, .56, from nostril, .29, along gape, .65; depth of bill, .13; tarsus, .70; middle toe and claw, .56; hind toe and claw, .43.

In the article on *Vireo gilvus*, in the Pacific R. R. Report (Birds N. America), I pointed out certain differences between western and eastern specimens, and applied the provisional name of *V. swainsoni* to the former. An examination of many additional specimens since that time has only tended to confirm the impression of the existence of two species, the differences noted, though apparently slight, being constant and readily appreciable. In the western bird (*V. swainsoni*) the bill is darker in color, much smaller, and more depressed, the depth at the base being less than the width, instead of being equal to it. The wing is more rounded, the second quill much shorter than the sixth, generally shorter or but little longer than the seventh. In eastern specimens (*V. gilva*) the second quill is about equal to the sixth. The second quill is about .30 of an inch (or more) shorter than the longest in *swainsoni*, while in *gilva* it is

only about .20 shorter. The feet of *swainsoni* are weaker, and the colors generally paler and grayer. "Iris dark brown" (*Coues*).

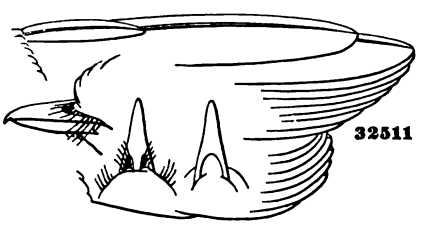
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
21,946	546	♂	Clark's Fork, Col.	June 7, '60.	A. Campbell.	Dr. Kennerly.
21,947	539	..	" [River.	June 1, '60.	"	"
6,826	..	..	Steilacoom, W. T.	...	Dr. Suckley.	.....
5,915	..	..	"	...	Dr. Cooper.	.....
5,521	747	♂	Petaluma, Cal.	May, 1856.	E. Samuels.	.....
12,891	2,091	..	Napa Valley.	...	A. J. Grayson.	.....
25,399	2,336	..	Fort Tejon, Cal.	Sept. 15, '57.	John Xantus.	.....
11,065	..	♀	Fort Bridger.	June 3, '58.	C. Drexler.	.....
11,066	..	♂	" [gwyn, N.M.	May 26, '58.	" [son.	.....
13,113	..	♂	Cantonment Bur-	...	Dr. W. W. Ander-	.....
37,006	594	♂	Fort Whipple, Ar.	Aug. 13, '64.	Dr. E. Coues.	.....
40,695	1,398	♀	"	May 8, '65.	"	.....

Vireosylvia josephæ.

Vireo josephæ, SCLATER, P. Z. S. 1859, 137, pl. 154 (Pallatanga, Ecuador).—IB. Catal. 1861, 42, no. 257.

Hab. Ecuador to Costa Rica; Puerto Cabello.

(No. 34,667.) First primary short, about two-fifths the 2d, which is about equal to the 8th or 9th; the 4th and 5th about equal and longest. (These proportions the same in five specimens.)



Vireosylvia josephæ. (Puerto Cabello.)

Above olive; greener and brighter on the rump, becoming brownish anteriorly, or more truly olive: the top and sides of head, with nape, olive brown. A broad stripe from nostrils over and beyond eye to nape, and a patch beneath it and eyelids quite pure white, leaving the lores and a post-ocular stripe like the head. Cheeks tinged with olive. Chin and throat whitish; rest of under parts yellow, deepest on sides and crissum. Sides of breast tinged with brownish-olive. Quills and tail feathers brown, edged externally with olive green, internally with pale yellow. No bands on the wings, but the greater coverts of a paler olivaceous than elsewhere. Bill dusky above, paler below; legs plumbeous. "Iris brown."

(No. 34,667, ♂.) Total length, 4.70; wing, 2.70; tail, 2.20; exposed portion of 1st primary, .65, of 2d, 1.75, of longest (5th) (measured from exposed base of 1st primary), 2.18; length of bill from forehead, .56, from nostril, .32, along gape, .71; tarsus, .67; middle toe and claw, .51; hind toe and claw, .38.

Of the five specimens before me, one, No. 27,947, from Bogota, furnished by Mr. Sclater as a type of his species, differs in the existence of an ochry brown tinge on the crissum, tail feathers, and

ends of primaries. It is possible that this may be an extraneous feature, as it has somewhat the appearance of a stain, and is not mentioned by Sclater. The chin and throat are rather more yellowish. There is, as far as I can see, no specific difference between this specimen and the others, the yellow of under parts, if anything, being there the deepest. The original description and figure, from an Ecuador (Pallatanga) series, represent the under parts as much whiter than in the present specimens, and it is barely possible that two species may be involved.

This species is markedly different from any other, and scarcely needs comparison. The proportions of quills are quite peculiar, and the brown cap, with the olive back is decidedly unique. In general form it constitutes a transition from *V. gilva* to *V. noveboracensis*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
27,947	257	..	Bogota.	...	Dr. Sclater.	.....
32,511	..	..	Puerto Cabello.	...	J. Krider.	.....
34,667	..	♂	Barranca, C. R.	April 16, '64	J. Carmiol.	.....
34,668	..	♀	"	"	"	.....
41,269	..	♂	"	Sept. 30, '65.	"	.....
35,241	..	♂	Dota, C. R.	July 28.	"	.....

(35,241.) Iris brown.

LANIVIREO, Baird.

COMMON CHARACTERS.—A broad stripe from bill to and around but not beyond the eye. Two broad whitish bands across wing coverts. Bill plumbeous.

A. Without spurious primary. Head above olive green. Line from bill to and around eye yellow.
  Back olive green like head; throat and breast yellow; rump and upper tail covert ashy . . . . *flavifrons.*

B. With spurious primary. Head above plumbeous. Line from bill to and around eye white.
  Back, edges of wing and tail olive green; sides of breast greenish-yellow. Wing 3.00.
    Upper tail coverts olive green: base of crissum sulphur yellow; sides of neck ash color; no yellow on side of throat . . . . *solitaria.*
    Upper tail coverts ashy; crissum white; sides of neck olive green; side of throat tinged with yellow . . . . . *propinqua.*
  Whole upper parts plumbeous, faintly olive towards rump. Beneath white, with only a very faint trace of olive on flanks. Wing 3.25 . . . . *plumbea.*

Vireosylvia flavifrons.

Vireo flavifrons, VIEILL. Ois. Am. Sept. I, 1807, 85, pl. liv.—AUD. Orn. Biog. II, 1834, pl. 119.—IB. Birds Am. IV, pl. 238.—CASSIN, Pr. A. N. Sc. 1851, 149.—SCLATER, P. Z. S. 1857, 227 (Vera Cruz); 1860, 257 (Orizaba).—SCLATER & SALVIN, Ibis, I, 1859, 12 (Guatemala). —CAB. Jour. III, 468 (Cuba; winter).—GUNDLACH, Cab. Jour. 1861, 324 (Cuba; rare).—CAB. Jour. 1860, 405 (Costa Rica).—*Vireo (Lanivireo) flav.* BAIRD, Birds N. Am. 1858, 341.

Muscicapa sylvicola, WILS. Am. Orn. II, 1810, 117, pl. vii, f. 3.

Hab. Eastern United States, south to Costa Rica. Very rare in Cuba.

(No. 28,390.) Head and neck above and on sides, with interscapular region, bright olive green. Lower back, rump, tail, and wing coverts ashy. Wings brown, with two white bands across the coverts, the outer edges of inner secondaries, and inner edges of all the quills, with inside of wing white. Outer primaries edged with gray, the inner with olive. Tail feathers brown, entirely encircled by a narrow edge of white. Under parts to middle of body, a line from nostrils over eye, eyelids and patch beneath the eye (bordered behind by the olive of neck) bright gamboge yellow; rest of under parts white, the flanks faintly glossed with ashy. Lores dusky. Bill and legs plumbeous black.

Vireosylvia flavifrons, ♀. (Carlisle, Pa.)

No spurious primary evident; 2d quill longest; 1st a little shorter than 3d.

Length, 5.80; wing, 3.00; tail, 2.00; difference of longest and innermost quills, .90; tarsus, .73.

Autumnal birds, perhaps more especially the young, are more glossed with olivaceous, which invades the ashy portions, and tinges the white.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
3,397	..	♂	Carlisle, Pa.	May 7, '47.	S. F. Baird.	.....
2,217	..	♀	"	May 3, 1847.	"	.....
12,228	..	♂	Washington, D. C.	April 30, '59	C. Drexler.	.....
28,924	..	♂	"	April 27, '61.	E. Coues.	.....
32,279	..	..	Liberty County, Ga.	...	Jos. Leconte.	.....
..	..	..	Union County, Ill.	...	R. Kennicott.	.....
7,423	..	..	Cleveland, O	...	Dr. Kirtland.	.....
8,340	65	♂	Independence, Mo.	June 13, '57.	Dr. Cooper.	.....
9,113	32,614	♂	Coban, Guat.	...	Verreaux.	.....
13,629	..	..	Guatemala.	...	J. Gould.	.....
	159	..	"	...	Cab. Lawrence.	.....
35,240	..	..	Grecia, C. R.	Dec. 3, '64.	J. Carmiol.	.....
33,299	..	..	San Jose, C. R.	...	"	.....
29,229	..	♀	Punta Arenas, C. R.	Mar. 18, '62.	Capt. J. M. Dow.	.....

Vireosylvia solitaria.

Muscicapa solitaria, WILS. Am. Orn. II, 1810, 143, pl. xvii, fig. 6.—*Vireo solitarius*, VIEILL. Nouv. Dict. XI, 1817.—AUD. Orn. Biog. I, pl. 23.—IB. Birds Am. IV, 1842, pl. 239.—CASSIN, Pr. A. N. Sc. 1851, 150.—SCLATER, P. Z. S. 1856, 298 (Cordova); 1859, 363 (Xalapa); 375 (Oaxaca?).—IB. Catal. 1861, 42, no. 255?—SCLATER & SALVIN, Ibis, 1860, 31 (Guatemala).—CAB. Jour. III, 468 (Cuba).—GUNDLACH, Cab. Jour. 1861, 324 (Cuba; very rare).—*Vireo* (*Lanivireo*) *sol.* BAIRD, Birds N. Am. 1858, 329.

?*Vireo cassini*, XANTUS, Pr. A. N. Sc. May, 1858, 117 (Fort Tejon).—BAIRD, Birds N. Am. 1858, 340, pl. 78, fig. 1 (same spec.).

Hab. United States, from Atlantic to Pacific; Cape St. Lucas. Not recorded from southern Rocky Mts., where replaced by *V. plumbea*. South to Mexico and Guatemala. Very rare in Cuba.

(No. 300, ♂.) Above olive green, including upper tail coverts; the top and sides of head and nape ashy plumbeous; sides of the neck plumbeous olive. Broad line from nostrils to and around eye, involving the whole lower eyelid, white. A loral line involving the edge of the eyelid, and a space beneath the eye dusky plumbeous. Beneath white; the sides yellow, overlaid with olive, this color not extending anterior to the breast. Axillars and base of crissum pale sulphur yellow, the long feathers of the latter much paler or nearly white. Wings with two bands and outer edges of innermost secondaries olivaceous-white; the quills dark brown, edged externally with olive green, internally with white; tail feathers similarly marked, except that the lateral feather is edged externally also with white, the central without internal border. Bill and legs blackish-plumbeous. Iris brown.

Vireosylvia solitaria. (Washington, D. C.)

First quill spurious, rather more than one-fifth the 2d, which is intermediate between 5th and 6th; 3d longest.

(No. 300, ♂.) Fresh specimen: Total length, 5.40; expanse of wings, 9.00. Prepared specimen: Total length, 5.25; wing, 2.95; tail, 2.35; difference between 10th and longest primary, .85; exposed portion of 1st primary, .50, of 2d, 2.08, of longest (measured from exposed base of 1st primary), 2.25; length of bill from forehead, .60, from nostril, .31, along gape, .66; tarsus, .72; middle toe and claw, .54; hind toe and claw, .46.

Spring specimens show sometimes a gloss of plumbeous on the back, obscuring the olive, the contrast of colors being greater in the autumnal and young birds. Sometimes the crissum appears nearly white. The length of the spurious primary varies consider-

ably: from .45–.75 of an inch. With the specimens before me I am unable to see any essential difference between eastern and western specimens.

A young bird from Fort Simpson is not materially different from the adult, exhibiting no trace of the spots of immature *Turdidæ* and *Sylvicolidæ*.

I am now inclined to consider the specimen upon which *Vireo cassini* was based to be only a dull-plumaged, winter skin of *V. solitaria*, with the under parts tinged with brownish-buff, and the olive shades obscured. I have never seen a specimen killed in eastern North America having this coloration, nor even making a decided approximation to it, but I can find no tangible characteristic of external form to distinguish them.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
300	..	♂	Carlisle, Pa.	April 21,'41.	S. F. Baird.	.....
929	..	♀	"	April 28,'43.	"	.....
29,273	1,421	..	Washington.	Oct. 17, '61.	D. W. Prentiss.	.....
32,277	..	♂	Liberty County, Ga.	...	Jos. Leconte.	.....
..	..	..	Illinois.	...	R. Kennicott.	.....
4,727	..	..	Mo. of Vermilion.	May 6.	Lt. Warren.	Dr. Hayden.
11,064	..	♂	Fort Bridger, Utah.	May 16.	C. Drexler.	.....
27,340	1,303	♀	Fort Simpson.	...	B. R. Ross.	.....
6,822	382	♂	Ft. Steilacoom, W.T.	May 13, '56.	Dr. Suckley.	.....
12,901	..	..	Napa Valley, Cal.	...	A. J. Grayson.	.....
21,378	..	♂	Yreka, Cal.	June 10.	W. Vuillé.	.....
25,398	2,245	..	Fort Tejon.	June 8, '57.	J. Xantus.	.....
10,229	..	..	" [C. St. Lucas.	...	"	.....
39,360	..	♂	San Gertrude Mts.,	Jan. 1861.	"	.....
37,497	42	♂	Orizaba, Mex.	Jan. 18, '65.	Prof. Sumichrast.	.....
38,158	..	..	"	...	M. Botteri.	.....

(6,822.) Iris hazel. (10,229.) Type of *V. cassini*.

Vireosylvia propinqua.

Vireosylvia propinqua, BAIRD, n. sp.

Hab. Coban, Guatemala.

(No. 20,402.) Top and sides of the head bluish-ash; a line from bill to eye, eyelids and under parts, including vent and crissum, white. Upper parts olive green, this color extending on the sides of the neck as far as the ear coverts. Throat and breast tinged with yellowish, deepest on the lateral portion. Two white bands on the wing. Bill and legs plumbeous. Quills and rectrices as in *solitaria*.

First or spurious primary very small, scarcely .30 of an inch; 2d quill equal to the 5th; the 3d longest.

(No. 20,402.) Total length, 5.10; wing, 3.00; tail, 2.35; exposed portion of 1st primary, .26, of 2d, 2.18, of longest, 3d (measured from exposed base of 1st primary), 2.30; length of bill from forehead, .60, from nostril, .31, along gape, .66; tarsus, .72; middle toe and claw, .63; hind toe and claw, .47.

In a series of Guatemalan birds, presented by Mr. Salvin to the Smithsonian Institution, was one labelled *Vireo solitarius*, which exhibits the following peculiarities when compared with a large number of North American specimens of *V. solitarius*. The olive of the back extends to, and includes the nape and sides of the neck back of the ears, which in the others are ashy plumbeous. The upper tail coverts are plumbeous, or ashy, not olive. The sides of the throat are sulphur yellow, not white, or with a faint tinge of olive. The flanks are white, only faintly tinged with olive, not olive green tinged with yellow. The anal region and crissum are pure white (the former especially), not yellow. The spurious primary is much smaller, and scarcely appreciable; the second quill is rather longer than the fifth, instead of being decidedly shorter. The whole wing is longer. The bill is broader at base.

The entire absence of any similarly marked specimen in the large series before me, some of them autumnal birds from Central America, induces me to think that the bird just described is really a distinct species, though where its headquarters may be, unless in Guatemala, I cannot imagine.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,402	954	..	Coban, Vera Paz.	Nov. 1859.	O. Salvin.	.....

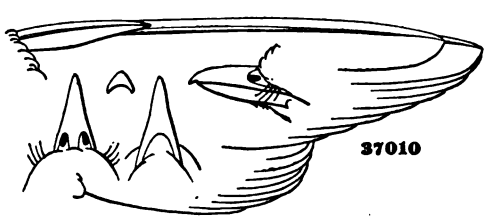
(20,402.) Type.

Vireosylvia plumbea.

Vireosylvia plumbea, COUES, Pr. A. N. Sc. Phila. 1866 (Fort Whipple, near Prescott, Arizona).

Hab. Southern Rocky Mountains. In winter to Colima, Mex.

(No. 37,011.) Whole upper parts and side of head uniform plumbeous; the lower part of the back with a faint wash of olivaceous. A white line from bill to and around eye; a dusky line from corner of eye to bill. Sides of breast and flanks plumbeous, paler than the back; the flanks very slightly tinged with olive green. Rest of under parts white; the axillars ashy, edged with white. Wings above with two conspicuous white bands; the innermost quills edged ex-



Vireosylvia plumbea. (Arizona.)

ternally, and the longer ones internally with white, the latter edged externally with light ash. Bill and legs dark plumbeous. "Iris hazel." Tail feathers narrowly edged all round with white, narrowest internally, and increasing from central to lateral feathers. Upper tail coverts clear ash.

As the specimen in finest plumage (described above) is moulting the quills, the measurements are taken from another (37,010). In this the 1st quill is not quite one-third the 2d, which equals the 6th; the 3d and 4th longest.

(No. 37,010.) Fresh specimen: Total length, 6.10; expanse of wings, 10.80. Prepared specimen: Total length, 5.75; wing, 3.25; tail, 2.70; difference between 10th and longest quill, .95; exposed portion of 1st primary, .75, of 2d, 2.34, of longest, 3d (measured from exposed base of 1st primary), 2.54; length of bill from forehead, .55, from nostril, .31, along gape, .70; tarsus, .75; middle toe and claw, .60, claw alone, .21; hind toe and claw, .50, claw alone, .23.

This species is in general character very similar to *V. solitaria*, although larger, especially with longer wings and tail, as shown by a comparison of the table of measurements. The olive green of *solitarius* is replaced by plumbeous, and the yellowish by white, forming a marked contrast in appearance. Only a faint trace of olive on the lower back and flanks represents the predominant coloration of *solitaria*. The olive external marginings of the wings are here replaced by ash; of the tail, by whitish. In some specimens, however, there is a slight edging of olive towards the base of the secondaries.

The specimens described above were killed in August; others killed in May are quite similar. No. 29,359, from Colima, in February, is slightly more olivaceous on the lower back and flanks.

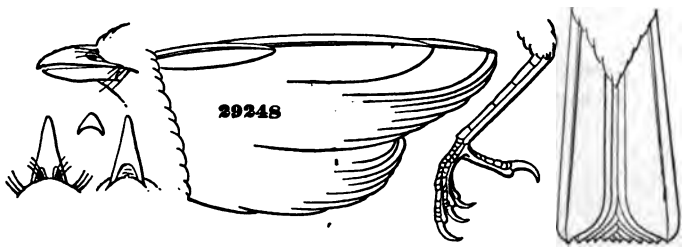
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
39,428	135	..	Laramie Peak.	June 1864.	Dr. R. Hitz.	.....
37,008	711	♀	Fort Whipple, Ar.	Sept. 8, '64.	Dr. E. Coues.	.....
37,009	596	♂	"	Aug. 15, '64.	"	.....
37,010	575	..	"	Aug. 18, '64.	"	.....
40,702	1,543	♀	"	July 29, '65.	"	.....
40,703	1,487	♂	"	May 17, '65.	"	.....
40,699	1,456	♂	"	May 12, '65	"	.....
29,359	118	..	Plains of Colima.	Feb. 1863.	J. Xantus.	.....

(37,009.) Iris brown. (40,702.) 6.00; 10.20. (40,703.) 5.60; 11.20.

VIREO, VIEILL.

Vireo, VIEILL. Ois. Am. Sept. I, 1807, 83. (Type *Muscicapa noveboracensis*, GM.)

Characters essentially those of *Vireosylvia;* the bill shorter; the 1st quill always present, better developed, sometimes more than half 2d. Wings shorter, more rounded; tarsi usually longer.



Vireo noveboracensis. (Pennsylvania.)

The species of *Vireo* are most easily tabulated by color, and in the following synopsis no regard is paid to external form, but species of *Vireo* and *Vireonella* are mixed together. It will, however, be remembered (page 326) that *V. noveboracensis, atricapillus, carmioli, huttoni, belli, vicinior*, and *pusillus* fall under the head of *Vireo* proper, with their longer, more pointed wings, and (except in *vicinior*) smaller outer primary—*belli, vicinior*, and *pusillus* differing, however, from the others in longer tarsi, and longer and more graduated tail, with narrower, more pointed feathers. Under *Vireonella* are to be ranged *V. modestus, latimeri, pallens, ochraceus, crassirostris, gundlachi*, and *hypochryseus*, each of which has a peculiar form. *V. modestus* in its very small bill approaches closely to *huttoni*, most of the other species having rather larger bills than the average.

COMMON CHARACTERS.—All the species olivaceous above, or ashy; beneath whitish, or olivaceous-yellow. Wings with light bands, except in *latimeri* and *hypochryseus*; tail without spots. A light stripe from bill to above eye, but not beyond it, except in *carmioli* and *hypochryseus*. In *atricapillus*, the top of the head is black.

A. Top and sides of head black. Chin and throat white. Back olive.
  A white line from the bill to and around eye.
    Beneath white; sides olivaceous; bill black . . . *atricapillus.*

B. Head above olivaceous or ashy. Chin and throat white; rest of under parts white or yellowish.
  A yellow line from bill to and around eye.
    Rest of under parts white; the sides yellowish; crissum paler.
      Bill blackish; two greenish-white bands on the wings; cap bright olive like the back . *noveboracensis.*
  A whitish line from bill to and around eye.
    Beneath white, except sides and crissum, which are pale yellow. Head above ashy; back olive.
      Wings pointed; 1st quill two-fifths the 2d, which equals the 8th. Bill .30 from nos-

tril; horn color above, pale beneath. One light band on wing coverts . . . . *belli.*

Beneath white; whole upper parts ashy. Scarcely olivaceous, except towards rump.

Wings pointed; 1st quill less than half 2d, which about equals the 8th. Bill .25 from nostril to tip; horn color above, whitish beneath. One white band on wing coverts *pusillus.*

Wings moderate; 1st quill rather more than half 2d, which about equals 9th and the secondaries. Bill .32 from nostril; entirely blackish-plumbeous. One white band on wing. Inner toe much shorter than outer . . . . . *vicinior.*

Wings rounded; 1st quill more than half 2d, which is shorter than 10th and the secondaries. Bill .35 from nostril; horn color above, whitish beneath. Two white bands on wing . . . . . *pallens.*

Rest of under parts yellow. Head and neck above ashy. No light bands on wings.

Wings rounded; 1st quill more than half 2d, which is shorter than the 10th. Bill .30 from nostril; light horn color . . . *latimeri.*

C. Head above olivaceous like the back. Chin and throat yellowish, more or less uniform with the remaining under parts. A yellowish line from bill to eye, not beyond it, except in *carmioli* and *hypochryseus;* wing bands wanting only in *hypochryseus.*

Bill small, attenuated; about .25 from nostrils to tip.

Superciliary stripe reaching beyond eye. Colors bright olive above, yellow beneath.

First quill two-fifths 2d; 3d but little shorter than the 5th (longest). Wings longer than tail . . . . *carmioli.*

Superciliary stripe reaching only to the eye. Colors dull olive above, and buffy yellow beneath.

First quill not quite half 2d, which is longer than 10th; 3d between 6th and 7th. Wings longer than tail. Olive of upper parts much brighter towards tail . . . . . *huttoni.*

First quill more than half 2d, which is about equal to 10th; 3d about equal to 7th. Wings equal to tail. Olive of upper parts uniform . . . *modestus.*

Bill large and robust; .30 or more from nostrils to tip.
First quill more than half 2d.
Superciliary stripe reaching only to the eye. Two whitish wing bands.
Second quill about equal to the secondaries.
Above bright olive green; beneath greenish-yellow, with buffy or ochry tinge. Wing bands and margins of secondaries broad. Eyelids and region behind eye uniform with the cheeks . *ochraceus.*
Above ashy olive. Wing bands and light outer margins of inner secondaries broad. Eyelids and region behind eye yellowish, in moderate contrast with the cheeks . . . . *crassirostris.*
Second quill decidedly shorter than the secondaries.
Above plumbeous olive. Wing bands very narrow; light edgings of inner secondaries almost inappreciable. Eyelids and region behind the eye yellowish, in strong contrast with the cheeks . . . . *gundlachi.*
Superciliary stripe reaching to the nape. No bands on the wing.
Second quill about equal to secondaries.
Above bright olive green; beneath, with superciliary stripe, deep olivaceous-yellow. Tail lengthened. (Largest and most deeply colored of all the species.) . *hypochryseus.*

VIREO, Vieill.

Vireo atricapillus.

Vireo atricapillus, WOODHOUSE, Pr. A. N. Sc. 1852, 60 (San Pedro, Tex.). —IB. Sitgreave's Rep. 1853, 75, pl. i, Birds.—CASSIN, Illust. 1854, 153, pl. xxiv.—BAIRD, Birds N. Am. 1858, 337.

Hab. Southern border of Western Texas.

(No. 6,818, ♂.) Top and sides of head and neck black; rest of upper parts olive green. Wing- and tail-feathers almost black on their upper surface, the quills and rectrices edged with olive (paler on the exterior primaries),

23 May, 1866.

the wing coverts with two greenish-white bands on a blackish ground. Broad line from bill to and around eye (not meeting on forehead) with under parts, white; the sides of body olivaceous; the axillars and inner wing coverts (perhaps crissum) yellowish. Bill black; feet plumbeous.

Vireo atricapillus, WOODH. (Texas.)

First quill less than half 2d, which about equals the 10th; 3d little shorter than 4th (longest).

(No. 6,818.) Fresh specimen: Total length, 4.75; expanse of wings, 7.25; wing from carpal joint, 2.12. Prepared specimen: Total length, 4.10; wing, 2.25; tail, 1.95; exposed portion of 1st primary, .66, of 2d, 1.48, of longest (measured from exposed base of 1st primary), 1.77; length of bill from forehead, .54, from nostril, .29, along gape, .61; tarsus, .75; middle toe and claw, .50, claw alone, .17; hind toe and claw, .40, claw alone, .19.

The black head of this species, as far as known, makes it unique in the genus. It is extremely rare, but three specimens being known.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
6,818	21	♂	San Pedro Riv., Tex.	...	Col. J. D. Graham.	J. H. Clark [house.
15,040	..	..	El Paso.	...	Capt. L. Sitgreaves.	Dr. S. W. Wood-

(6,818.) 4.75; 7.25; 2.12. (15,040.) Type.

Vireo noveboracensis.

Muscicapa noveboracensis, GM. Syst. Nat. I, 1788, 947 (*Green Fly-Catcher*, PENNANT, Arctic Zool. II, 389).—*Vireo noveb.* BON. Obs. Wilson, 1825.—AUD. Orn. Biog. I, 328, pl. 63.—IB. Birds Am. IV, pl. 240.—CASSIN, Pr. A. N. Sc. 1851, 150.—BAIRD, Birds N. Am. 1858, 338.—MAX. Cab. Jour. VI, 1858, 187.—SCLATER, P. Z. S. 1857, 204 (Xalapa); 228 (Vera Cruz).—IB. Catal. 1861, 42, no. 256.—SCL. & SALV. Ibis, II, 1860, 274 (Coban, Guat.).—JONES, Nat. Bermuda, 1859, 71 (resident).—CAB. Jour. III, 469 (Cuba).—GUNDLACH, Cab. Jour. 1861, 324 (Cuba; rare).

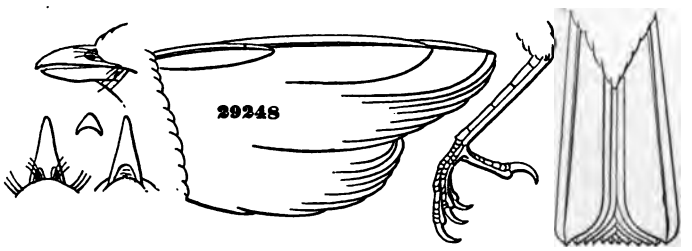
Vireo musicus, VIEILL. Ois. Am. Sept. I, 1807, 83, pl. 53.—*Muscicapa cantatrix*, WILS. II, 1810, 266, pl. xviii.

Hab. United States, west to base of Rocky Mountains; south to Guatemala; Bogota? Very rare in Cuba. Abundant and resident in the Bermudas.

(No. 10,193, ♂.) First primary about half the length of 2d, which is longer than secondaries, and about equal to the 8th; the 4th longest; 3d and 5th little shorter.

Above quite bright olive green; the sides of neck, and a gloss on its upper surface, ashy. The middle concealed portion of feathers of lower back and rump pale sulphur yellowish. Beneath white; the chin and lower cheeks

with a grayish tinge; the sides of breast and body, with axillars and base of crissum (more faintly), bright yellow; the inner wing coverts and rest of



Vireo noveboracensis.

crissum much paler, almost white. A broad yellow line from nostrils to, and continuous with a yellow ring round the eye, which is encircled exteriorly by olivaceous; a dusky loral, but no post-ocular spot. Wings with two covert-bands and innermost secondaries externally broadly yellowish-white; rest of quills edged externally with olive, except the two outer and tips of other primaries, which are grayish. Rectrices edged externally with olive, except outermost, which is bordered by grayish. All the long quills bordered internally by whitish. Bill blue-black, paler on the edges; legs dark plumbeous. Iris white.

(No. 10,193, ♂.) Total length, 4.90; wing, 2.40; tail, 2.20; exposed portion of 1st primary, .78, of 2d, 1.56, of longest, (4th and 5th) (measured from exposed base of 1st primary), 1.86; length of bill from forehead, .53, from nostril, .30, along gape, .62; tarsus, .70; middle toe and claw, .50, claw alone, 16; hind toe and claw, .40, claw alone, .20.

(No. 1,036, ♂.) Fresh specimen: Total length, 5.00; expanse of wings, 8.00; wing from carpal joint, 2.50. Prepared specimen: Total length, 4.75; wing, 2.50; tail, 2.25; difference between 10th and longest quills, .45; exposed portion of 1st primary, .86, of 2d, 1.56, of longest (measured from exposed base of 1st primary), 1.90; length of bill from forehead, .51, from nostril, .29, along gape, .62; tarsus, .76; middle toe and claw, .52, claw alone, .18; hind toe and claw, .46, claw alone, .25.

Specimens vary slightly in a greater amount of ashy on the head, and less brilliancy of the yellow of head and sides. Sometimes there is a decided ashy shade in the white of throat and jugulum, which again has a very faint tinge of yellowish.

A young bird does not differ in markings from the adult.

A specimen marked "Colombia" is rather smaller than the average, but otherwise similar.

The measurements of the feet of No. 10,193, ♂, appear to be quite abnormal, and I add those of No. 1,036, ♂, as more accurately expressing the average in these respects.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
7,108	..	..	Philadelphia.	...	Phila. A. N. Sc.	.....
1,036	..	♂	Washington, D. C.	May 26, '43.	W. M. Baird.	.....
1,037	..	♀	"	June 12, '43.	"	.....
..	..	..	"	...	Dr. E. Coues.	.....
10,193	..	♂	Union County, Ill.	April 21.	R. Kennicott.	.....
10,351	..	..	Key West, Fla.	Dec. 29, '59.	G. Wurdemann.	.....
34,360	317	♂	Republican Fork.	May 26, '64.	Dr. E. Coues.	.....
13,124	38	♀	Upper Missouri.	...	Dr. Hayden.	.....
3,972	..	..	Brownsville, Tex.	...	Lt. Couch.	.....
6,836	..	..	Above El Paso, Tex.	...	Dr. T. C. Henry.	.....
6,837	..	..	Western Texas.	...	Col. J. D. Graham.	J. H. Clark.
17,307	..	..	W. of Ft. Arbuckle.	May 13, '60.	J. H. Clark.	C. S. M'Carthy.
..	181	..	Mexico.	...	Cab. Lawrence.	Sallé.
37,914	208	♂	Merida, Yuc.	Feb. 22, '65.	Gov. Salazar.	Dr. A. Schott.
27,945	..	..	Honduras.	...	Dr. P. L. Sclater.	.....
27,946	..	..	Colombia.	...	"	.....
41,656	..	..	Bermuda.	...	C. M. Allen.	.....

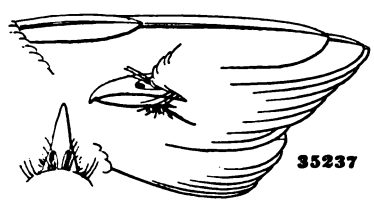
(1,036.) 5.00; 8.00; 2.50. (1,037.) 5.10; 2.50. (34,360.) 5.10; 7.70. (17,307.) With eggs. No. 2,529. (37,914.) Iris white.

Vireo carmioli.

Vireo carmioli, BAIRD, n. sp.

Hab. Highlands of Costa Rica.

(No. 35,237, ♂.) Wings lengthened, considerably longer than the slightly rounded tail; the 1st quill about two-fifths the 2d, which equals the 7th (much longer than 10th); 4th and 5th nearly equal, and longest; 3d little shorter. Feet short, about two-thirds tarsus. Bill small, slender and attenuated; the lateral outlines decidedly concave.



Vireo carmioli, BAIRD. (Costa Rica.)

(No. 35,236.) Above bright olive green; beneath clear greenish-yellow, palest (almost whitish) on throat; tinged with olive green on sides and breast; purer yellow inside the wings, the quills and tail-feathers edged internally with pale sulphur yellow. Wings with two broad bars, and broad outer edges of inner secondaries greenish-yellow, contrasting very strongly with the almost black of the wing-feathers; rest of quill- and the tail-feathers edged externally with olive-green, paler towards the extremity; the edges of the outermost feather of wing and tail much paler. A conspicuous yellowish line from nostrils over the eye, and extending nearly as far behind it as in front of it, though not reaching the nape, and not interrupted above; lower eyelids similar. A dusky loral spot from corner of eye to angle of mouth; rest of cheeks olivaceous. Bill quite dusky; lower mandible paler; legs plumbeous. "Iris brown."

(No. 35,237, ♂.) Total length, 4.50; wing, 2.50; tail, 2.20; difference between 10th quill and longest, .45; exposed portion of 1st primary, .70, of 2d, 1.65, of longest, 3d, measured from exposed base of 1st primary), 1.85; length of bill from forehead, .50, from nostril, .25, along gape, .55; depth, 15; tarsus,

.75; middle toe and claw, .50, claw alone, .16; hind toe and claw, .42, claw alone, .21.

Of the two specimens No. 35,237 has the wings perfect, but is apparently immature; the head has an ochry tinge, not seen in the other, and the eye stripe paler. No. 35,236, which probably best represents the normal state of coloration, lacks the outer primary on both sides, and exhibits other indications of a condition of moulting. Both agree, however, in many peculiarities, sharply separating the new species from any other in the complete series of *Vireonidæ* before me. I have named it after Mr. Julian Carmiol, who has been so indefatigable in developing the ornithology of Costa Rica.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
35,236	..	♀	Dota, Costa Rica.	July 27, '64.	J. Carmiol.	.....
35,237	..	♂	"	"	"	.....

(35,236.) Type. (35,237.) Type. Iris brown.

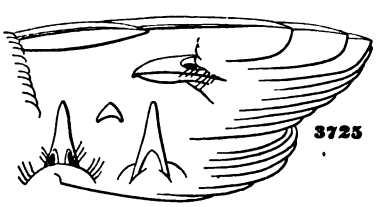
Vireo huttoni.

Vireo huttoni, CASSIN, Pr. A. N. Sc. Phila. 1851, 150 (Monterey, Cal.).—IB. 1852, pl. i, fig. 1.—BAIRD, Birds N. Am. 1858, 339, pl. 78, fig. 2.—SCLATER, P. Z. S. 1858, 302 (Oaxaca); 1862, 19 (La Parada).—IB. Catal. 1861, 358, no. 256.

Hab. California and Western Mexico, to Oaxaca.

(No. 3,725.) First quill rather less than half 2d, which about equals the 10th; 3d a little longer than 7th; 4th and 5th nearly equal, and longest. Tail slightly rounded, shorter than wings. Bill very small.

Above olive green; brightest behind, especially on rump and edging of tail, duller and more ashy towards and on top and sides of head and neck. Wings with two bands on coverts, and outer edges of innermost secondaries rather broadly olivaceous-white; other quills edged externally with olive green, paler towards outer primary; internally with whitish. Lateral tail-feather edged externally with yellowish-white. Feathers of rump with much concealed yellowish-gray.



Vireo huttoni, CASSIN. (California.)

Under parts pale olivaceous-yellowish; purest behind, lightest on throat and abdomen; the breast more olivaceous, the sides still deeper olive green, the breast soiled with a slight buffy tinge. Axillars and crissum yellowish; the inside of wings whitish. Loral

region and a narrow space around eye dull yellowish, in faint contrast to the olive of head. Bill horn color above, paler below; legs dusky.

(No. 3,725.) Total length, 4.70; wing, 2.40; tail, 2.05; difference between 10th and longest quills, .43; exposed portion of 1st primary, .72, of 2d, 1.52, of longest, 4th and 5th (measured from exposed base of 1st primary), 1.90; length of bill from forehead, .45, from nostril, .29, along gape, .60; tarsus, .72; middle toe and claw, .50, claw alone, .16; hind toe and claw, .45, claw alone, .22.

The description just given is based upon the type specimen, probably in winter plumage. Spring specimens do not vary materially except in greater purity of white edgings of the feathers. Two Mexican specimens are rather larger, the wing measuring 2.50, the tail 2.30. No other differences are appreciable. In general the first primary is about half the second, sometimes rather less.

This species is readily distinguished from other *Vireos*, excepting *V. modestus*, which it greatly resembles in the small bill, form, coloration, and size; nor indeed is it easy to distinguish them. In *modestus*, however, the first quill is usually more than half the second, not less; the wing shorter, and less pointed; the tail longer. The upper parts are more uniform, not much brighter towards rump and tail. The quite distinct circum-ocular light ring of *huttoni* is scarcely if at all appreciable. The wide separation geographically is of much importance.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
39,486	44	..	San Francisco, Cal.	Spring,'65.	Col. Bulkley.	E. J. Lorquieu.
12,903	103	..	Napa Valley, Cal.	...	Col. A. J. Grayson.	.....
17,769	649	..	California.	...	Jas. Hepburn.	.....
3,725	..	..	Monterey, Cal.	June, 1847.	W. Hutton.	.....
3,724	..	..	"	"	"	.....
3,973	..	♂	Monterey, Mex.	...	Lt. D. N. Couch.	.....
29,707	..	..	La Parada, W. Mex.	Jan. 1861.	A. Sallé.	Boucard.
..	256*b*	♀	"	Feb. 1861.	Cab. Dr. Sclater.	Sallé.

(3,725.) Type. (3,973.) "Eyes dark brown."

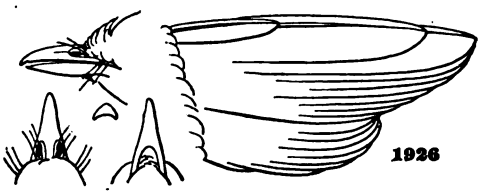
Vireo bellii.

Vireo bellii, AUD. Birds Am. VII, 1844, 333, pl. 485 (Missouri River).—CASSIN, Pr. A. N. Sc. Phila. 1851, 150.—BAIRD, Birds N. Am. 1858, 337.—SCLATER, Catal. 1861, 42, no. 258.—BON. Consp. 1850, 330.

Hab. United States, from Missouri River to base of Rocky Mountains.

(No. 1,926.) Above olive green, brightest on the rump; tinged anteriorly with ashy; the top and sides of head ashy, in faint contrast. A line from nostrils to eye (scarcely beyond it), and eyelids very pale yellowish-white; lores dusky. Under parts, including inner wing, coverts and edge of wing creamy

white; the sides, axillars, and crissum pale yellow (sides of lower, neck, and of breast glossed with olivaceous), faintest on the longer feathers of the latter. Two rather narrow bands on the wing coverts, and the outer edges of innermost secondaries white; the other quills edged with faded olivaceous. Inner edges of quills whitish. Tail feathers brown, edged externally with olive; internally fading into paler brown. Median portion of rump feathers concealed pale yellowish. Bill horn-color above, pale below. Legs plumbeous. "Iris brown."



Vireo bellii, AUD. (Dacota.)

First quill spurious; not quite half the 2d, which is about equal to the 8th; 3d and 4th quills longest; 5th scarcely shorter. Tail nearly even, or a little rounded, the feathers narrow.

(No. 1,926.) Total length, 4.20; wing, 2.18; tail, 1.90; exposed portion of 1st primary .60, of 2d, 1.32, of longest, 3d (measured from exposed base of 1st primary), 1.60; length of bill from forehead, .51, from nostril, .28, along gape, .60; tarsus, .75; middle toe and claw, .54; hind toe and claw, .42.

The above description is taken from a type specimen received from Mr. Audubon, and represents the average spring plumage. Autumnal skins are rather brighter, and there is occasionally an ochraceous tinge on the white of the under parts.

This species at first sight appears like a miniature of *V. gilvus*, the head being almost exactly similar. The back is, however, much brighter olive, the sides and crissum deeper yellow. The superciliary light stripe is shorter. The white markings of the wings are wanting in *gilvus*. The wing, tail, and feet are entirely different in their proportions.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
1,926	..	..	Fort Union, Dac.	1843.	S. F. Baird.	J. J. Audubon.
8,197	133	♀	Nemaha Riv., Kans.	July 16, '57.	W. M. Magraw.	Dr. J. G. Cooper.
8,187	123	♂	Shawnee Riv. Mis'n	July 4, '57	"	"
26,229	..	♀	Neosho Falls, Kans.	...	B. F. Goss.	.....
19,085	41	♂	Fort Cobb, Ark.	May 23, '60.	J. H. Clark.	.....
34,361	342	♂	Republican Fork.	May 27, '64.	Dr. E. Coues.	.....
4,979	..	..	Ft. Chadbourn, Tex.	...	Dr. E. Swift, U.S.A.	.....
6,816	..	..	Western Texas.	...	Capt. Pope, U.S.A.	.....
6,817	..	..	"	...	Col. J D Graham.	J. H. Clark.
12,528	..	♂	San Pedro Riv., Tex.	May 24, '51.	Capt. Sitgreaves.	Dr. Woodhouse.

(1,926.) Type. (26,229.) With eggs. (19,085.) With eggs. (34,361.) 4.80; 6.90.

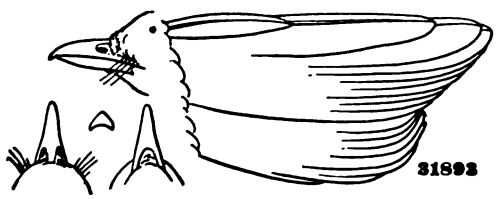
Vireo pusillus.

Vireo pusillus, COUES, Pr. A. N. Sc. Phila. 1866.
? *Vireo bellii*, COOPER, Pr. Cal. Acad. 1861, 122 (Fort Mohave).

Hab. Cape St. Lucas, San Diego, Fort Mohave, and Arizona.

Somewhat similar in general appearance to *Vireosylvia gilva* and *swainsoni*, but smaller. Bill very small; tarsi lengthened. Wings about equal to the tail, which is lengthened, graduated, and with the feathers narrow and pointed. Exposed part of 1st primary about half that of the 2d, which is intermediate between 7th and 8th; the 4th and 5th longest.

Above grayish-ash, with a tinge of olive behind. Beneath, including the inside of the wings, white, with a soiled tinge on the sides of the throat and across the breast. Axillars and flanks, exhibiting a faint trace of greenish-yellow. Eyelids and a short line from the nostrils to the eye whitish; no other stripe apparent. A dusky loral spot. Primary coverts edged indistinctly with whitish, producing an obscure band (a second on the middle coverts hardly appreciable). Quills and tail feather edged externally with pale grayish-olive, the innermost secondaries with whitish. Bill dusky above, whitish beneath. Legs plumbeous. Iris of two specimens marked as "light brown," of another as "rufous."



Vireo pusillus, COUES. (California.)

The details of structure taken from No. 23,785, of color from 23,788. Length of 23,785, ♂, 4.80 when fresh, of skin, 4.25; wing, 2.25; tail, 2.25; bill above, .37; tarsus, 73; middle toe and claw, .50; hind toe and claw, .42. First quill, .70; 2d, 1.40; longest (5th), 1.64. (Cape St. Lucas.)

Since writing the preceding description, I have received a *Vireo* (No. 31,893), collected by Dr. Cooper, at San Diego, which, although considerably larger, I cannot distinguish specifically. The difference in size is what might be expected between specimens from Cape St. Lucas and San Diego, and the occurrence of a Cape species at the latter place is in accordance with the facts observed in other instances where such birds as *Sialia arctica*, *Polioptila melanura*, etc., equally peculiar to the middle province, have found their way to the California coast at San Diego, through the break in the coast range of mountains.

The larger specimen somewhat resembles *V. pallens* of Central America, but has a much smaller bill and a longer tail, with but one distinct white band on the wing. The bill is about the size of that in *V. huttoni;* but the white under parts and other differences of

coloration and form distinguish them. The measurements are as follows:—[1]

(No. 31,893, ♂.) Total length, 4.70; wing, 2.30; tail, 2.35; exposed portion of 1st primary, .71, of 2d, 1.44, of longest (3d, 4th, and 5th), (measured from exposed base of 1st primary), 1.70; length of bill from forehead, .40, from nostril, .25, along gape, .55; tarsus, .75; middle toe and claw, .46, claw alone, .16; hind toe and claw, .38, claw alone, .18

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
16,956	1,942	♂	Cape St. Lucas.	...	John Xantus.	.....
16,957	1,931	..	" [Lucas.	...	"	.....
23,785	3,462	♂	San Jose, Cape St.	Dec. 1859.	"	.....
23,788	6,023	♂	Sierra San Gertrude, Cape St. Lucas.	Jan. 1861.	" [ney.	.....
31,893	259c	♂	San Diego, ? Cal.	April 24,'62.	Prof. J. D. Whit-	Dr. J. G. Cooper.
40,696	1,522	♀	Date Creek, 50 m. S. of Prescott, Ariz.	June 6, '65.	Dr. E. Coues.	.....

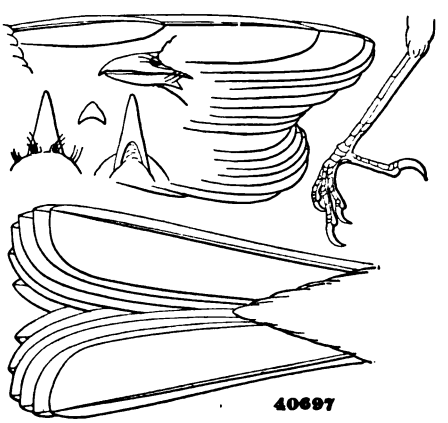
(16,957.) 4.55. Iris light brown. (23,785.) 4.80. Iris rufous. (31,893.) 5.50; 7.25; 2.30. Iris brown. (40,696.) Eye brown; bill light horn, almost white beneath. Has loud and melodious song. (Coues.)

Vireo vicinior.

Vireo vicinior, COUES, Pr. A. N. Sc. Phila. 1866.

Hab. Prescott, Arizona.

(No. 40,697, ♂.) Bill stout, considerably compressed and deep. Wings moderately pointed, about equal to tail, which is decidedly graduated; 1st quill rather more than half 2d, which about equals 9th and the secondaries; the 4th and 5th longest. Tarsus considerably longer than middle toe and claw; lateral toes quite conspicuous for their disproportion, the inner claw reaching only to base of outer, and falling short of base of middle; the terminal digit of inner toe reaching only to end of second joint of middle toe.



Vireo vicinior, COUES. (Arizona.)

Upper parts, with sides of head and neck, ashy or light plumbeous, faintly olivaceous on rump. Beneath white;

[1] After the completion of the present article the specimen, No. 40,696, was received from Dr. E. Coues (agreeing with No. 31,893 in size), thus extending the range of the species to Arizona, as might have been anticipated.

(No. 31,893, ♂.) Fresh specimen: Total length, 5.50 (4.50?); expanse of wings, 7.25; wing from carpal joint, 2.30.

slightly ashy on sides of breast. Flanks and inside of wings showing a faint trace of yellow, only appreciable on raising the wings. An obsolete line from bill to eye, and a more distinct ring round the eye, white. No bands on the wing, except a faint edging of whitish on the greater coverts; the quills edged internally with white. Bill and legs plumbeous. "Iris brown. Mouth livid, bluish-white." (*Coues.*)

Fresh specimen: Total length, 5.60; expanse of wings, 8.60. Prepared specimen: Total length, 5.10; wing, 2.50; tail, 2.60, its graduation, .22; difference of 10th and longest quills, .40; exposed portion of 1st primary, .85, of 2d, 1.65, of longest (measured from exposed base of 1st primary), 1.95; length of bill from forehead, .50, from nostril, .32, along gape, .61; depth of bill, 18; tarsus, .72; middle toe and claw, .51, claw alone, .16; hind toe and claw, .40, claw alone, .19.

This species would at first sight be taken for a small specimen of *V. plumbea*, the colors, character of bill, etc., being exactly similar, except that the white of lores and around eye is much less distinct, and there is only one faint band on wing, instead of two conspicuous ones; the tail feathers, too, lack the distinct white edgings. The much more rounded wing, and the first primary half the second or more, will, however, readily distinguish them. The form of the bird is very much that of *V. pusillus*, which it resembles also in color. The outer quill is, however, longer, the bill deeper and more compressed, the inner lateral toe considerably shorter, and the size larger. The colors are purer, without the olive of the back or the yellowish of the under parts; the bill, too, is entirely dark plumbeous, instead of horn color, whitish beneath. From *V. pallens* it is distinguished by smaller, darker bill; longer tail and wing; one wing band, not two, and purer colors.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
40,697	1,507	♂	Fort Whipple, near [Prescott, Ar.	May 24, '65.	Elliot Coues, M.D.	Type.

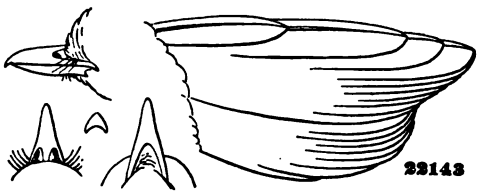
Vireo modestus.

Vireo modestus, Sclater, P. Z. S. 1860, 462 (Jamaica); 1861, 72, pl. xiv, fig. 1.—Id. Catal. 1861, 43, no. 259.—March, Pr. A. N. Sc. 1863, 294.—*V. noveboracensis*, Gosse, Birds Jam. 1847, 192 (not of Gmelin).

Hab. Jamaica.

(No. 22,143, ♀.) The whole upper parts are of a dull olive green, with a shade of brown, the sides of head and neck paler. The quills and tail feathers are brown; the 1st and 2d primaries very faintly edged with whitish, the

next more broadly, this color gradually changing to bright olive on the secondaries and tertials. Two distinct bands on the wing, and the outer edges of inner tertials are yellowish-white. The tail feathers are edged externally with olive green, the outermost having a narrow edge of whitish. Under parts pale yellow, palest on throat, and with a tinge of buff on the belly and crissum. Sides of neck, breast, and flanks tinged with olive, which also washes the front of the breast. Under wing covers whitish, the axillars sulphur yellow. Bill light horn color above, whitish beneath; legs plumbeous. Loral region light olive yellow, in slight contrast with the forehead. There is little or no concealed yellow on the feathers of the rump.



Vireo modestus, SCLATER. (Jamaica.)

The tail about the length of the wings, or a little shorter, rounded; the lateral feathers .16 of an inch shorter than the middle. The wing is concave; the primaries .35 longer than the secondaries; the 1st primary rather more than half the 2d, which is about as long as the secondaries; the 3d is rather shorter than the 7th, the 4th and 5th longest. The bill is compressed; the tarsus is rather more than one and one-third the length of middle toe and claw.

(No. 22,143, ♂.) Total length, 4.75; wing, 2.30; tail, 2.21; difference between 10th and longest quills, .34; exposed portion of first primary, .78, of 2d, 1.41, of longest (4th and 5th), (measured from exposed base of 1st primary), 1.75; length of bill from forehead, .50, from nostril, .26, along gape, .60; tarsus, .75; middle toe and claw, .55, claw alone, .17; hind toe and claw, .41, claw alone, .20.

The specimen described above agrees very well with the description and figure of Dr. Sclater. Four others are all smaller, one of them (received from Dr. Sclater), No. 23,323, more olivaceous beneath, brighter green above; another, No. 22,159, grayer above, belly without buff tinge, and the whitish edging of lateral tail feather wanting. In these differences, however, there is hardly enough to warrant a separation into two species.

This species is readily distinguished from *V. gundlachi* by the smaller size, longer wings, more olive back, less clearly defined yellow belly, and in having light markings on the wings and tail. *V. bahamensis* is larger, the bill much larger, the tail proportionally shorter; the third quill but little shorter than the fourth. *Vireo noveboracensis* has much longer wings, a white throat and belly, and yellow front. Its nearest relative is *V. huttoni*. This, however, has a smaller bill, longer wings, even tail with brighter olive edging; the lower back and rump considerably brighter than the

head and interscapular region. The first primary is barely half, or not half the second, instead of more than half as in *modestus*.

NOTE.—The point of upper mandible, as seen from above, is not sufficiently acute in the figure.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,323	23	♀	Trelawney, Jam.	Oct. 17, '58.	Dr. Sclater.	W. Osburn.
22,143	..	♂	Spanishtown, Jam.	...	W. T. March.	.....
22,159	..	..	"	...	"	.....
24,370	52	♀	"	Nov. 6, '61.	"	.....
24,371	52	♂	"	"	"	.....

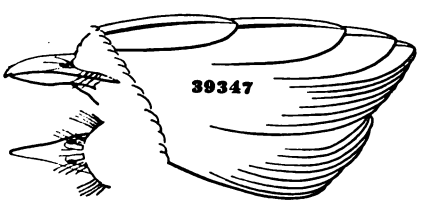
(23,323.) A type.

Vireo latimeri.

Vireo latimeri, BAIRD, n. sp.

Hab. Porto Rico.

(No. 39,347.) Upper parts olivaceous; brightest and greenest on lower back and rump, passing anteriorly into almost clear gray on the head, the interscapular region soiled with reddish olive. No light bands nor edging of the wings, excepting the olive green borders of the quills, becoming paler towards the edge of the wing. Chin and throat, with a line from bill to eye, and eyelids, white. Sides of head gray. Breast and remaining under parts yellow, palest centrally, tinged with greenish on sides. Inside of wings pale yellowish, inner edges of quills tinged with the same. Bill light horn color, paler below; legs plumbeous. "Iris hazel."



Vireo latimeri, BAIRD. (Porto Rico.)

Wings short, though longer than tail, concave, much rounded—the difference between the 10th and longest primary being but .23 of an inch. First quill much more than half 2d, about half 3d, which is shorter than 7th; 4th and 5th about equal and longest. Tail short, nearly even.

(No. 39,347.) Total length, 4.80; wing, 2.20; tail, 1.90; difference between 10th and longest quills, .24; exposed portion of 1st primary, .76, of 2d, 1.35, of longest (4th and 5th), (measured from exposed base of 1st primary), 1.68; length of bill from forehead, .55, from nostril, .32, along gape, .64; tarsus, .75; middle toe and claw, .55, claw alone, .16; hind toe and claw, .45, claw alone, .20.

This species, in its gray head and neck in contrast to the yellowish of under parts, is quite different from any other excepting *V. josephæ*. The wings, however, are much shorter, and differently proportioned;

the brown cap and post-ocular stripe are wanting, and the light line from bill only goes to the eye, instead of passing broadly to the nape. I have great pleasure in dedicating it to Mr. Geo. Latimer, of Porto Rico, at whose expense a valuable collection of birds of the Island was made and presented to the Institution—the species just described among them.

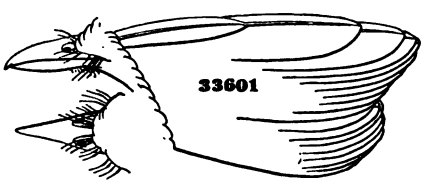
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
39,348	..	..	Porto Rico, N. Side.	1864–5.	Geo. Latimer.	Iris hazel.
39,347	..	..	"	"	"	Type.

Vireo pallens.

Vireo pallens, SALVIN, P. Z. S. May, 1863, 188 (Realejo and Punta Arenas).

Hab. West coast of Central America.

(No. 33,601.) Wings short and rounded, about equal to the tail; 1st quill rather less than half the 2d, which is less than the secondaries; 3d about equal to the 7th; 4th and 5th longest. Bill large and stout; feet well developed, the claws reaching to end of tail. Tail rather rounded, the feathers narrow; the lateral .15 shorter than central.



Vireo pallens, SALVIN. (Nicaragua.)

Upper parts dull grayish-olive; a little brighter perhaps on rump and edges of quill- and tail-feathers. No difference appreciable in color of the outer edge of lateral tail feather. Two bands on the wing, and outer edges of inner secondaries white. No concealed yellowish on rump. Beneath soiled white, with a very slight tinge of olivaceous on sides; the lining of wings and inner edges of quills pure white. Tibiæ ashy. A whitish line from bill to, and perhaps a narrow ring around the eye. Lores dusky. Bill horn color above, pale below; feet dusky.

(No. 33,601.) Total length, 4.70; wing, 2.10; tail, 2.00; difference between 10th and longest quills, .25; exposed portion of 1st primary, .70, of 2d, 1.35, of longest (measured from exposed base of 1st primary), 1.64; length of bill from forehead, .58, from nostril, .35, along gape, .68; tarsus, .80; middle toe and claw, .55, claw alone, .20; hind toe and claw, .50, claw alone, .24.

This species is very similar in form and general appearance to *V. pusillus*, agreeing in the rounded tail with narrow pointed feathers, lengthened legs, long claws, etc., with about the same dimensions; otherwise, however, the bill and feet are much larger, measuring

from nostril .35, instead of .25; the tarsi .80, not .75. The wings are more rounded, the difference between longest primary and tenth being .30 instead of .40. The differences from *V. vicinior*, Coues, are noted under that species.

The specimen described is one of the types of Mr. Salvin, and kindly presented by that gentleman and Capt. Dow.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
33,601	4,682	..	Realejo, Nic.	May 16, '63.	Capt. Dow & O. Salvin.	A type.

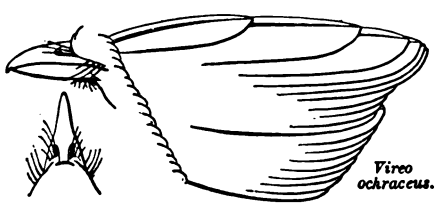
Vireo ochraceus.

Vireo ochraceus, SALVIN, P. Z. S. 1863, 188, no. 5 (San Jose, Guat.)

? *V. semiflavus*, SALVIN, P. Z. S. 1863, 188, no. 6 (Peten, Guat.)

Hab. Western and southern Mexico, Yucatan, and Guatemala.

(No. 427, Salvin's Coll.) Wings short and rounded, a little longer than the tail; 1st quill nearly half as long as the 3d, considerably more than half the 2d; 5th and 6th quills longest; 4th little shorter; 2d shorter than 10th; 3d equal to 8th. Bill large, broad at base, and rather depressed, the sides nearly straight. Tail somewhat rounded, the feathers narrow.



Vireo ochraceus.

Above olive green, with a soiled buffy or reddish tinge; the olive purest on the rump. Beneath yellow with a reddish olive tinge; paler on throat, more olive on sides and perhaps across breast; the inside of wings paler yellow; the inner edges of quills whitish. Cheeks olive. A brighter yellowish line from bill along upper edge of eye to its posterior corner, although apparently interrupted above the eye, and not extending around lower eyelids, the space from eye to angle of mouth more dusky. Wings with two broad bands, and outer edges of inner secondaries olivaceous-white, in decided contrast with the blackish-brown ground; the rest of quills and the tail feathers edged with olive green. Bill horn color above, paler below. Legs plumbeous.

(No. 427, ♀.) Total length, 4.50; wing, 2.20; tail, 2.00; difference between 10th quill and longest, .21; exposed portion of 1st primary, .80, of 2d, 1.36, of longest (5th and 6th), (measured from exposed base of 1st primary), 1.66; length of bill from forehead, .55, from nostril, .29, along gape, .60; tarsus, .79; middle toe and claw, .56, claw alone, .20; hind toe and claw, .45, claw alone, .22.

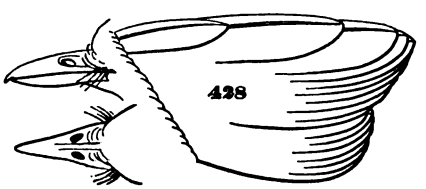
The lack of a light mark below the eye and the interruption above it of the usual superciliary stripe, causing the latter to reappear

again as a small yellowish spot above the posterior corner, seems quite peculiar.

A specimen (male, June 16) from Mazatlan agrees closely in form with the present bird, although rather larger. The first quill is only a little more than half the second. The colors are duller, and the under parts paler; the white markings are less distinct, owing to the worn condition of the feathers. The extension of the range of the species from Southern Guatemala to Mazatlan is an interesting fact, paralleled by the facts in the case of *Hirundo albilinea*, various *Trochilidæ*, etc., no specimens of which have hitherto been observed in the intermediate coast of Mexico.

The type of the species described above has been kindly furnished by Mr. Salvin.

Vireo semiflavus (the type of which I have before me from Mr. Salvin) I can hardly consider as distinct from *ochraceus*, as it resembles it very closely in size, form, and proportions. The first quill, in the type, is shorter than in *ochraceus*—being not quite half the second; the other quills are as in *V. ochraceus*. The upper parts are rather brighter green; the under parts lack the ochrey tinge, and the light markings on the wing are narrower. The same peculiarities of the eye stripe are seen in both types. The difference of coloration is what might be expected between birds killed in January and in April, and the difference in length of outer quills such as is met with frequently in well established species.



Vireo semiflavus.

(No. 428.) Total length, 4.40; wing, 2.10; tail, 1.95; difference between 10th and longest quills, .20; exposed portion of 1st primary, .62, of 2d, 1.25, of longest, 5th and 6th (measured from exposed base of 1st primary), 1.60; length of bill from forehead, .54, from nostril, .30, along gape, .60; tarsus, 78; middle toe and claw, .52, claw alone, .18; hind toe and claw, .44, claw alone, .20.

A specimen from Merida, Yucatan (April), a locality nearly due north of Lake Peten, and closely related to the region of the latter in its zoological geography, agrees in general characters, but has the outer primary a little more than half the second, although not as long as in the type of *ochraceus*—about what it is in the Mazatlan specimen. The bill is darker and rather narrower.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
34,025	1	♂	Mazatlan, Mex.	June 16, '62.	Col. A. J. Grayson.	.....
..	427	♀	San Jose, Guat.	Jan. 1863.	O. Salvin.	.....
..	428	♂	Sakluk, Peten, Guat	April, 1862.	"	.....
39,278	394	♂	Merida, Yucatan.	April 14, '65.	Gov. Salazar.	Dr. A. Schott.

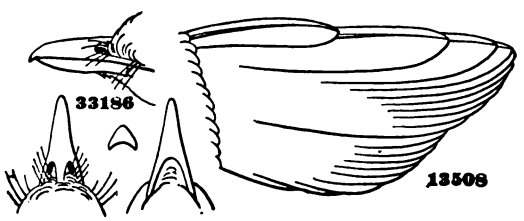
(427.) The type of *V. ochraceus*. (428.) The type of *V. semiflavus*. (39,278.) Most like No. 428.

Vireo crassirostris.

Lanivireo cr. BRYANT, Pr. Bost. Soc. N. H. VII, 1859 (Bahamas).

Hab. Bahamas.

(No. 13,508.) Upper parts grayish-olive, the edges of quills and tail-feathers brighter olive green. Beneath pale yellowish, soiled slightly with ashy; brightest on sides and crissum, paler on middle of belly; flanks tinged with olivaceous; quills edged internally with white. Two well-marked bands on wings, and broad outer edges of inner secondaries yellowish-white. A yellow band from nostril (meeting its fellow) to the eye, and a narrow yellow ring around it. Bill dark plumbeous horn color, lighter along edges. Feet dark plumbeous.



Vireo crassirostris, BRYANT. (Bahamas.)

Wings longer than the tail (2.40 to 2.10). The 1st or spurious primary more than half the length of the 2d, which is shorter than the 9th primary, and about equal to the secondaries (not shorter, as in *V. gundlachi*); the 4th, 5th, and 6th quills are longest, their tips reaching about .30 beyond the secondaries. Tail slightly rounded, the feathers narrow and pointed. The tarsi are long and stout (.85 of an inch), and measure one and a half times as much as the middle toe and claw. The bill is unusually stout and large, and the feet well developed.

(No. 13,508.) Total length, 4.55; wing, 2.40; tail, 2.15; difference between 10th quill and longest, .30; exposed portion of 1st primary, .77, of 2d, 1.33, of longest, 4th and 5th (measured from exposed base of 1st primary), 1.66; length of bill from forehead, .58, from nostril, .35, along gape, .70; depth, .19; tarsus, .85; middle toe and claw, .54, claw alone, .20; hind toe and claw, .50, claw alone, .24.

In some specimens the yellow of the forehead is much obscured. The anterior corner of the eye is dusky. The cheeks are tinged with olive green. The yellow of under parts is not uniform and continuous. The type of the species is not so bright in its colors as specimens received subsequently from Nassau.

This species is closely related to *V. gundlachi* in size, form, and general appearance; but differs in the much stouter, darker bill, larger legs; the wings longer than the tail, instead of shorter; the second quill equal to secondaries, instead of much shorter. The olive of back is grayish, not plumbeous; the under parts duller yellow, and the two conspicuous wing bands and broad edging of inner secondaries are reduced to a minimum. The much brighter olive green edging of quills and tail-feathers are inconspicuous in *gundlachi*.

In color of bill and general appearance of upper parts and forehead there is quite a resemblance to *V. noveboracensis;* the larger bill and prevailing yellow of under parts readily distinguish it. It also in color is somewhat like *V. modestus;* but the bill is very much larger, the upper parts duller olive, the frontal yellow brighter, etc.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
13,508	..	..	Nassau, N. P.	April, 1859.	Dr. H. Bryant.	A type.
33,186	..	..	"	April, 1864.	Lt. Fitzgerald.	.....
33,187	..	..	"	"	"	.....
..	..	..	"	"	"	In alcohol.

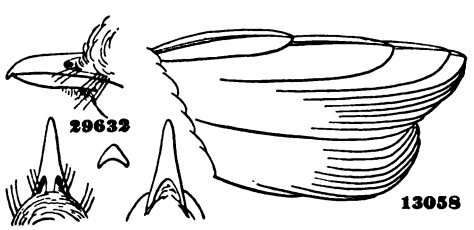
VIREONELLA, Baird.

Vireo gundlachi.

Vireo gundlachi, LEMBEYE, Aves de la Cuba, 1850, 29, pl. v, fig. 1 (Cienfuegos, Cuba).—CAB. Jour. III, 468.

Hab. Cuba.

(No. 13058, ♂.) Upper parts of an olivaceous-plumbeous; the under, with the loral region, and a circle around the eye (the latter brighter) dull yellow, as in *V. philadelphica*. Sides tinged with olivaceous. There are two narrow, very inconspicuous pale bands on the wing. The tail- and wing-feathers are brown, edged with the color of the back (without any whitish), the outer edge of the outer tail feather not paler than in the others. Quills edged internally with white. Bill pale horn color above, a little lighter beneath. Legs plumbeous.



Vireo gundlachi, LEMB. (Cuba.)

Wings extremely short and much rounded, nearly a quarter of an inch shorter than the tail; 1st primary large, and more than half the 2d, which is much shorter (.20 of an inch) than any of the secondaries, and .40 of an inch

less than the longest quill. The 4th quill is longest; the 5th and 6th scarcely shorter; the 7th, 8th, and 9th decreasing gradually; the 3d about intermediate between 7th and 8th. The primaries in the closed wing are scarcely more than .20 of an inch longer than the secondaries. Tail slightly rounded, the feathers narrow and somewhat pointed, the lateral about .15 of an inch shorter than the central. The bill is much compressed, being considerably higher than broad, though not dissimilar in shape to that of *V. flavifrons*. The feet are large; the tarsi long, about one and a third times the length of middle toe and claw.

(No. 13,058, ♂.) Total length, 4.80; wing, 2.10; tail, 2.20; difference between 10th primary and longest, .20; exposed portion of 1st primary, .75, of 2d, 1.25, of longest (4th) (measured from exposed base of 1st primary), 1.64; length of bill from forehead, .59, from nostril, .30, along gape, .65, depth, .17; tarsus, .79; middle toe and claw, .58, claw alone, .20; hind toe and claw, .48, claw alone, .23.

Another specimen (No. 29,632): Wing, 2.26; tail, 2.45; exposed portion of 1st primary, .66, of 2d, 1.30, of longest, .1.74.

A second specimen (No. 29,632) has the wings and tail longer, 2.26 and 2.48; the first quill is only half the second, which, however, like the others, is much shorter than the secondaries.

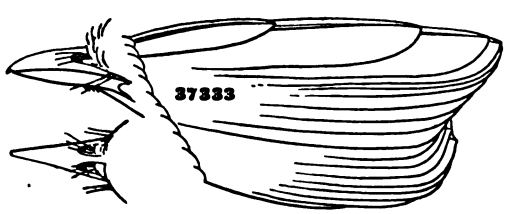
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
13,058	..	♂	Cuba.	...	G. N. Lawrence.	.....
..	162	..	"	...	Cab. Lawrence.	.....
29,632	..	♂	Fermina, W. Cuba.	Feb. 20.	Chas. Wright.	.....

Vireo hypochryseus.

Vireo hypochryseus, SCLATER, P. Z. S. 1862, 369, pl. 46 (Mexico).

Hab. Tres Marias Islands, N. W. coast of Mexico.

(No. 37,331, ♂.) Wings short, rounded, about equal to tail: much graduated; 1st quill more than half 2d, which about equals the 10th; the 6th quill longest; the 5th and 4th but little shorter. Tail considerably rounded (in one specimen the lateral feather .38 shorter than middle). Bill stout. Legs rather weak, the claws falling far short of end of tail.



Vireo hypochryseus, SCLATER. (Tres Marias.)

Whole upper parts, with sides of neck, bright yellowish-green, without light bands or edgings; beneath deep yellow, tinged with olive on sides and perhaps on breast. A broad line from bill over the eye to nape, and eyelids, bright yellow; the cheeks below the eye more olivaceous; quills edged in-

ternally with white, the outer edges of primaries with gray. Bill rather dark horn color, paler on the edges and end of lower mandible. Legs dark plumbeous.

The nostrils are circular, and in the anterior extremity of the nasal groove; the tips of frontal feathers reaching to their posterior edge, but not growing up to it. The tongue is broad and fleshy, the end thin, flat, and horny; the tip quite deeply cleft; the outer edge somewhat lacerated. (*Note from alcoholic specimen.*)

(No. 37,331, ♂.) Total length, 5.65; wing, 2.50; tail, 2.50, graduation, .25; difference between 10th primary and longest, .38; exposed portion of 1st primary, .90, of 2d, 1.58, of longest (6th) (measured from exposed base of 1st primary), 1.94; length of bill from forehead, .62, from nostril, .35, along gape, .71; tarsus, .78; middle toe and claw, .54, claw alone, .20; hind toe and claw, .46, claw alone, .23.

The type specimen of the species, kindly lent by Dr. Sclater, agrees exactly with those from the Three Marias. The species is quite unique in its peculiar coloration, and its discovery at the Three Marias is one of the most interesting of the results of Col. Grayson's important explorations in northwestern Mexico. The exact locality of Dr. Sclater's bird has not been indicated.

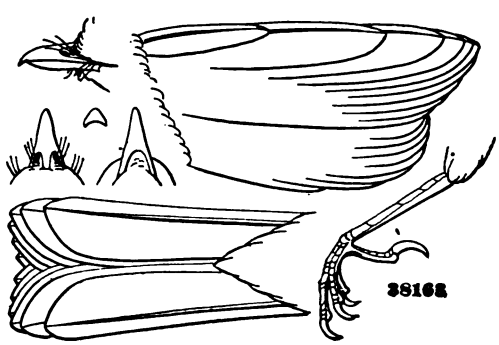
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
37,331	84	♂	Tres Marias, Isl. N.	Jan. 1865.	Col. A. J. Grayson.	.....
37,332	83	♂	" [W. Mex.	"	"	.....
..	..	..	"	"	"	.....
..	..	..	"	"	"	.....
..	..	..	"	"	"	.....
..	..	..	Mexico.	...	Cab. Dr. Sclater.	Parzudaki.

(.) In alcohol. (.) In alcohol. (.) The type of species.

NEOCHLOE, SCLATER.

Neochloe, SCLATER, P. Z. S. 1857, 213. (Type *N. brevipennis.*)

Form short and thick. Head large. Wings a little longer than the tail, which is considerably rounded; wing short and broad; the primaries not much longer than secondaries; the outer six graduated; the 1st more than half the 2d, which is shorter than the secondaries; the 3d about equal to 9th or 10th; the 6th longest. Feet slender, rather long, similar to *Vireo*. Bill not differing much from *Vireo*, but rather broader and more depressed at base.



Neochloe brevipennis, SCLATER. (Orizaba.)

The essential characters of this genus are to be found in the considerably rounded tail, which somewhat exceeds the wings, and in the very short, much rounded wings and considerable amount of graduation of the primaries—the sixth being longest, the second shorter than the secondaries, and the third barely longer than the tenth. But one species is known, the coloration of which is entirely peculiar in the family.

Neochloe brevipennis.

Neochloe brevipennis, SCLATER, P. Z. S. 1857, 213 (Orizaba, *Botteri*).

Hab. Orizaba.

(No. 38,163.) Wing much graduated; the 6th longest; first quill more than half 2d; second shorter than secondaries. Tail longer than wings, somewhat graduated.

General color dark ashy plumbeous; the entire top of head and nape sap green; the outer surface of wings bright greenish-yellow, edges of tail feathers and upper tail coverts similar, but duller; edge of bend of wing bright yellow. Chin and median region of abdomen, including crissum, white, as are the lining of wing and inner edges of quills. Concealed portion of wing and tail feathers above, as well as their under surfaces, almost black, especially the quills. Bill and feet plumbeous black.

(No. 38,163.) Total length, 4.40; wing, 2.25; tail, 2.40; difference of feathers, .24; difference of 10th and longest quills, .34; exposed portion of 1st primary, .67, of 2d, 1.26, of 3d, 1.56, of longest (6th) (measured from exposed base of 1st primary), 1.80; length of bill from forehead, .50, from nostril, .25, along gape, .56; tarsus, .75; middle toe and claw, .53, claw alone, .15; hind toe and claw, .44, claw alone, .23.

The outer edges only of the quills are green, so that the inner secondaries exhibit a good deal of black. The outer two primaries are edged with gray, not green, and on the other primaries the latter color changes to gray towards the end. The specimen described is the second known, the type, also collected by M. Botteri, being in the British Museum.

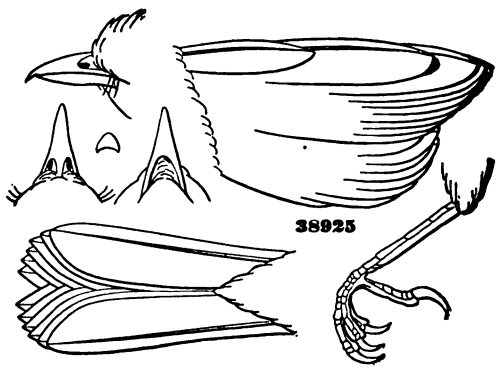
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
38,163	271	..	Orizaba, Mex.	...	M. Botteri.	M. Botteri.

HYLOPHILUS, TEMM.

"*Hylophilus*, TEMM. Pl. Col. 173, fig. 2. (Type *H. pœcilotis*, TEMM.")

Similar to *Vireo* in general appearance, but shorter and stouter. Wing short, rounded, about equal to the tail, which is narrow and rounded, the

feathers frequently considerably pointed. Primaries but little longer than secondaries; the 1st about half the 2d, which generally equals the secondaries; the 4th and 5th longest. Bill more conical than in *Vireo;* the culmen curving very slightly, sometimes nearly straight to the but little decurved tip, the notch of which is long and shallow. Bristles of mouth less developed. Legs lengthened; claws very sharp and larger than in *Vireo;* hind toe longer; both the lateral claws reaching beyond base of middle claw; the outer beyond the middle of the claw. Adhesion of toes as in *Vireo.*



Hylophilus viridiflavus, LAWR. (Panama.)

This genus is easily distinguished from the Vireos by the conical, more acute bill, but slightly decurved at tip, more arched commissure, longer hind toe, much larger claws, and a more rounded wing than usual in *Vireo.* In the character of the feet it comes quite near *Laletes.*

The species of *Hylophilus* which I have had the opportunity of examining agree very well in general characters, the principal variation consisting in trifling differences in the proportions of the quills and length and graduation of tail. The first quill is usually less than half the longest: in *insularis* it is more than half. The tail in the type is longer than the wing; in others it is about equal; in a few species it is shorter.

The following synopsis expresses the characters of the species known to me:—

COMMON CHARACTERS.—General color of upper parts olive green, the head, or at least the forehead, usually differing in having an ochrey or rufous wash, sometimes seen on the tail or back, sometimes wanting; the forehead generally more yellowish. No bands on wings or tail. Under parts whitish, yellowish, or olivaceous. Bill generally pale. Legs flesh color or plumbeous.

A. Head and nape above uniform cinnamon brown. Forehead not different.
   Rufous of head confined to upper surface. Under parts fulvous yellowish. Legs dusky . . . . *pœcilotis.*

B. Cap rufous or ochraceous, well defined against color of back; forehead much brighter.

Forehead and vertex much brighter ochraceous than rest of head. Whole upper parts, except the olivaceous rump, more or less rufous; breast tinged with the same. Legs flesh color . . . . *ochraceiceps.*

Forehead rusty brown. Upper parts dark olive green; tail alone tinged with rufous. Beneath light olivaceous-green. Legs dusky . . . . . *ferruginifrons.*

Forehead ochrey yellow. Back and tail bright olive green, without rufous. Beneath clear yellow. Legs plumbeous . . . . . *aurantiifrons.*

C. Cap tinged with bistre or sepia brown, shading gradually off into the olive of back; the rump only bright olive. Forehead paler only, not brighter. The only yellow of abdomen on crissum.

Cap tinged with bistre brown, as is the back. Beneath soiled fulvous white; throat grayer; flanks olivaceous. Legs yellowish. First quill not half the longest . . . . . *acuticauda.*

Cap and back ochrey ash. Beneath soiled smoky fulvous ash; no olive on flanks. Legs pale. First quill more than half longest . . . . . *insularis.*

D. Cap and forehead clear olive green, uniform with the remainder of upper parts.

Beneath bright yellow; paler on throat. Legs yellow *viridiflavus.*

E. Cap clear ash color, in abrupt contrast with the bright olive green of remaining upper parts. Beneath whitish. Sides of body and crissum olivaceous.

Ash of head and nape sharply defined behind and on side of neck; unmixed with olive. Flanks strongly washed with olive green . . . . . *decurtatus.*

Ash of head and nape less extended, and indistinct behind and on side of neck; mixed or washed with olive. Flanks only slightly washed with olive yellow. Upper parts more yellow. Size smaller . . . . . *pusillus.*

None of the species of *Hylophilus* mentioned in the foot-note, all belonging to South America, have yet come under my observation.[1]

[1] **Hylophilus semibrunneus,** LAFR. Rev. Zool. 1845, 341 (Bogota).

Olive; head, neck, and upper part of back olive brown; beneath pale olive yellowish; throat, bend of wing, and middle of abdomen whitish; bill pale brown; feet plumbeous. Length, 4.50.

Similar to *H. pœcilotis*, but differs in having decidedly larger bill, and in having the brown of head extending over the ears, the whole neck, and upper part of back.

Hylophilus pœcilotis.

Hylophilus pœcilotis, Temm. Pl. Col. (1823), 173, fig. 1 (from Maximilian's specimen).—Bon. Consp. 1850, 329,—Burm. Uebers. III, 1857, 110.—Cab. Mus. Hein. 1850–1, 64.—Sclater, Catal. 1861, 44, no. 269.—*Sylvia pœcilotis*, Max. Beit. II, 1831, 715 (Bahia and Minas).

Hab. Eastern Brazil.

(No. 173, Cab. G. N. Lawrence.) First quill lengthened, about half the longest; 2d quill rather shorter than 10th; 4th longest. Wing not quite as long as the tail, which is somewhat graduated.

Upper parts bright olive green; the whole cap, with nape, light cinnamon brown. Beneath grayish-white, tinged with fulvous or brownish-yellow on the breast; the sides with olive. Inside of wings yellow, as are the inner edges of the quills. Sides of head ashy; ear coverts plumbeous, with whitish

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Hylophilus flavipes, Lafr. Rev. Zool. 1845, 342 (Bogota).

Above grayish-olive, cap a little darker; beneath ochraceous-yellowish, the throat whitish; breast dirty palish; bill pale brown; feet yellowish. Length, 4.50.

Hylophilus frontalis, Tschudi, Arch. Naturg. 1844.—Ib. Fauna Peruana, 1846, 194, pl. xiii, f. 1. Eastern Peru.

Above olive green; the forehead and line from base of bill to eye, citron yellow; tail grayish-green. Under parts greenish-yellow, paler on throat; the breast and crissum somewhat tinged with rufous brown. Lower wing coverts olive. Bill brown; feet plumbeous; iris brown. Length, 6.25.

Hylophilus olivaceus, Tschudi, Arch. Naturg. 1844.—Ib. F. Peruana, 1846, 195. *Hab.* Eastern Peru.

Allied to *H. thoracicus*, but differing in color. Above ashy olive, forehead and rump brighter; eyelids yellowish. Beneath dull yellow; olivaceous on breast and throat, the belly and crissum whitish. Under wing coverts white. Bill reddish-brown; tarsi reddish. Irides brown. Length, 4.50; wing, 2.33.

Hylophilus thoracicus, Temm. Pl. Col. 173, fig. 1.—*Sylvia thoracica*, Max. Beit. III, 1831, 717. *Hab.* Coast of Brazil.

Above olive green; cheeks gray. Beneath pale yellow; crissum white; legs plumbeous. Length, 5.50. (Burmeister, III, 110.)

Hylophilus flaveolus, Burm. Th. Bras. III, 110.—*Sylvia flaveola*, Max. Beit. III, 1831, 719. *Hab.* Bahia.

Above grayish-brown; wings and tail more reddish-brown. Lower back, breast, and belly reddish-yellow; throat white; legs plumbeous. Length, 5.70. (Burmeister.)

Hylophilus cinerascens, Max. Beit. III, 1831, 723.—Burm. Th. Bras. III, 111. *Hab.* Espirito Santo Riv., Brazil.

Above greenish-olive gray. Beneath grayish-white; wing coverts grayish-brown, edged with pale yellowish-red; legs plumbeous. Length, 4.15.

shaft-streaks. Crissum pale yellowish. Bill horn color, paler beneath; legs dusky. Iris "grayish-brown" (*Max.*).

(No. 173, Bahia.) Total length, 4.40; wing, 2.10; tail, 2.25; difference of feathers, .30; difference of 10th and longest quills, .30; exposed portion of 1st primary, .80, of 2d, 1.32, of longest (4th) (measured from exposed base of 1st primary), 1.60; length of bill from forehead, .54, from nostril, .31, along gape, .60; tarsus, .70; middle toe and claw, .52, claw alone, .16; hind toe and claw, .44, claw alone, .21.

The description given above is from a Bahia specimen belonging to Mr. Lawrence. Another, in defective condition, from an unknown locality on the coast of Brazil (No. 23,979), is much more yellow beneath, including crissum, and with the wings of same length, has the tail much longer (2.60).

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
24,008	..	..	Brazil.	...	.....	Dr. G. B. Horner.
23,979	..	..	"	...	.....	"
..	173	..	Bahia.	...	.....	Cab. Lawrence.

Hylophilus ochraceiceps.

Hylophilus ochraceiceps, SCLATER, P. Z. S. 1859, 375 (Oaxaca). — IB. Catal. 1861, 44, no. 268.—SCLATER & SALVIN, Ibis, 1860, 397. (Guatemala).

Hab. Western Mexico, to Costa Rica.

(No. 22,375, ♂, a type.) Third quill equal to 7th; 2d considerably shorter than 10th and secondaries; tail rounded.

Upper parts olivaceous-rufous; the tail clear rufous brown; the rump dull olive green. Cap brownish ochrey, brighter anteriorly, more yellow on the edges anterior to the eye. Beneath faint ochrey yellow; the chin and throat, with cheeks more ashy, the breast more ochrey, the flanks and crissum more olivaceous, the inside of wings and inner edges of quills yellowish. Edges of inner secondaries externally like the back, their border becoming paler towards the outer primaries, the coverts at the base of the primary quills clear dark brown, forming a marked spot. Bill horn color above, paler below; feet apparently reddish.

(No. 22,375, ♂, type.) Total length, 4.10; wing, 2.20; tail, 1.95; difference of feathers, .25; difference of 10th and longest quills, 28; exposed portion of 1st primary, .72, of 2d, 1.30, of longest (5th) (measured from exposed base of 1st primary), 1.65; length of bill from forehead, .60, from nostril, .35, along gape, .65; tarsus, .68; middle toe and claw, .50, claw alone, .20; hind toe and claw, .48, claw alone, .22.

A second specimen, from Costa Rica, agrees with the one just described, but with less of the ochrey tinge on the breast.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
22,375	40,736	..	Mexico (Oaxaca?).	...	Verreaux.	Type.
34,780	..	..	Angostura, C. R.	June 10, '64.	J. Carmiol.	.....

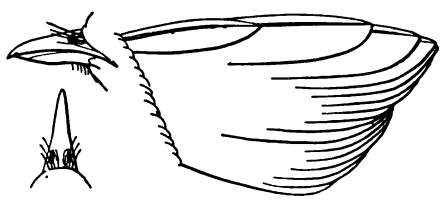
Hylophilus ferruginifrons.

Hylophilus ferruginifrons, SCLATER, P. Z. S. 1862, 110 (New Grenada).

Hab. New Grenada.

(Type.) Fourth and 5th quills longest; 2d about equal to 10th and secondaries; 1st less than half the longest.

Above dark olive green, brighter and lighter on rump and edges of inner quills (becoming paler towards the outer ones), the tail tinged with umber brown. Forehead almost ferruginous. Beneath grayish olive; paler on throat and middle of belly. Inside of wings, axillars, and inner edges of quills clear yellow. Crissum yellowish. Bill dusky, the commissural edges and end of lower mandible paler; legs dusky?



Hylophilus ferruginifrons, SCLATER. (N. Grenada.)

(Type. Cab. Sclater.) Total length, about 4.25; wing, 2.30; tail, 1.80; difference between 10th and longest primary, .35; exposed portion of 1st primary, .76, of 2d, 1.31, of longest (4th) (measured from exposed base of 1st primary), 1.65; length of bill from forehead, .58, from nostril, .32, along gape, .64; tarsus, .70; middle toe and claw, .48, claw alone, .10; hind toe and claw, .46, claw alone, .22.

Dr. Sclater has kindly lent me his type specimen of the above species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
..	..	..	Bogota.	...	Cab. P. L. Sclater.	Type.

Hylophilus aurantiifrons.

Hylophilus aurantiifrons, LAWRENCE, Ann. N. Y. Lyc. 1861, 324 (Birds Panama, II, 211). Panama.

Hab. Isthmus Panama.

(No. 38,926.) Fourth quill longest; 3d about equal to 6th; 2d equal to 10th or secondaries; 1st less than half the 3d.

Above light olive green, brighter behind. Forehead fulvous yellow, the rest of cap ashy olive, tinged with fulvous or ochrey, scarcely distinguishable behind from the back, which is slightly washed with the same. Cheeks like head above, but lighter. A yellowish loral spot passing to upper part of eye; the eyelids whitish. Under parts pale yellow, lightest (almost white) on throat, darker inside the wings and on crissum; flanks slightly olivaceous. Inner edges of quills yellowish-white; outer edges of exterior primaries gray, of other quills olive. Tail feathers decidedly olive, edged internally with yellowish. Bill above horn color, flesh color below; legs plumbeous.

(No. 38,926, ♂.) Total length, 4.30; wing, 2.25; tail, 2.05; difference of 10th and longest primary, .31; exposed portion of 1st primary, .80, of 2d, 1.45, of longest (4th) (measured from exposed base of 1st primary), 1.75; length of bill from forehead, .61, from nostril, .35, along gape, .66; tarsus, .62; middle toe and claw, .46, claw alone, .13; hind toe and claw, .46, claw alone, .21.

The specimen described agrees quite well with the type, but is larger and brighter in color. The shade of olive in the cap is darker and redder than that of the back.

This species, of about the same size, closely resembles *viridiflavus* in color, especially below. The latter is, however, of a richer, more ochrey yellow below, lacks the colored front, and has the cap uniform with the back. The whole bill is reddish, and the feet are flesh color or red, not plumbeous.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
38,926	85	♂	Panama.	Jan. 10, '65.	Fred. Hicks.	.....
..	173	♂	"	...	Cab. Lawrence.	M'Lean. & Galb.

(38,926.) Eye dark; legs lead; upper bill smoky; lower pinkish. (.) Type.

Hylophilus acuticauda.

Hylophilus acuticaudus, LAWRENCE, Pr. A. N. Sc. 1865, 37 (Venezuela).

Hab. Venezuela.

(No. 399, type.) Wings short and much rounded; tail lengthened, longer than the wings, the feathers narrow and lanceolate. Second quill considerably shorter than 10th; 3d about equal to 9th.

Above dull olive, browner anteriorly, brighter towards rump and on edges of quills; the forehead with some concealed yellowish at base of feathers. Sides of head, throat, and breast pale dull brownish-ash; belly fulvous white; flanks olivaceous; crissum, tibia, and inner lining of wings (including inner edges of quills), yellow. Bill light horn color, paler below; legs pale brownish-yellow.

(No. 399, type.) Total length, 4.50; wing, 1.85; tail, 2.00; difference of 10th and longest quills, .16; exposed portion of 1st primary, .65, of 2d, 1.20,

of longest (4th) (measured from exposed base of 1st primary), 1.45; length of bill from forehead, .53, from nostril, 30, along gape, .60; tarsus, .67; hind toe and claw, .44.

The type specimen of this species does not appear entirely mature, although if so the coloration of the adult will probably not be materially different. It perhaps comes nearest in coloration to the description of *H. flavipes*, Lafr.

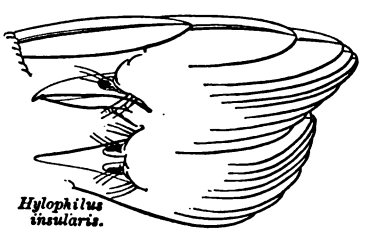
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
..	399	..	Venezuela.	...	Cab. Lawrence.	Type.

Hylophilus insularis.

Hylophilus insularis, SCLATER, P. Z. S. 1861, 128 (Tobago).

Hab. Island of Tobago. (*Kirk.*)

(No. 270*, Dr. Sclater's type.) Fourth, 5th, and 6th quills nearly equal and longest; 2d equal to secondaries; exposed portion of 1st primary more than half the longest. Upper parts olive green, becoming brighter behind, especially on upper tail coverts and edges of wing- and tail-feathers; anteriorly more and more tinged with dull ochrey ashy brown. Base of upper mandible, cheeks, and under parts soiled smoky light brownish-buff (almost sepia brown). Inside of wings and axillars bright yellow; inner edges of quills paler yellow. Crissum and tibiæ yellowish-olive. No olive on flanks. Bill dark horn color; paler below. Legs pale.



Hylophilus insularis.

(No. 270*, Scl. Cab.) Total length, 4.60; wing, 2.50; tail, 2.15; difference between 10th and longest quills, .28; exposed portion of 1st primary, 1.08, of 2d, 1.64, of longest (5th) (measured from exposed base of 1st primary), 1.92; length of bill from forehead, .64, from nostril, .37, along gape, .80; tarsus, .78; middle toe and claw, .52; claw alone, .18; hind toe and claw, .44, claw alone, .22.

I am indebted to Dr. Sclater for the opportunity of examining the type of this species.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	270*	..	Tobago.	...	Cab. Dr. Sclater.	Kirk.

(270*.) Type.

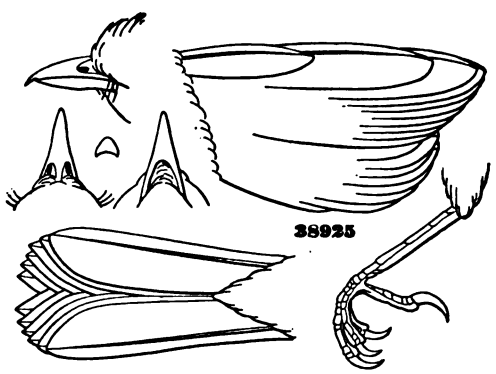
Hylophilus viridiflavus.

Hylophilus viridiflavus, LAWRENCE, Ann. N. Y. Lyc. 1861, 324 (Birds Panama, II, 212 (Isth. Panama).—SCLATER & SALVIN, P. Z. S. 1864, 348 (Isth. Panama).

Hab. Isthmus Panama.

(No. 38,924, ♀.) Fourth quill longest; 3d, 5th, and 6th little shorter; 2d equal to 10th; 1st about half longest. Wings very short and much rounded, about equal to the graduated tail.

Above light olive green, rather brighter behind. Beneath, including bend and lining of wings, rich yellow. Cheeks pale ash; chin and throat tinged with the same. Loral region gray. Bill and legs pale yellow. ("In life bill and legs slightly pinkish; iris yellowish, nearly white." *Hicks.*)



Hylophilus viridiflavus, LAWR. (Panama.)

Fresh specimen: Total length, 4.75; expanse of wings, 6.50. Prepared specimen: Total length, 4.60; wing, 2.15; tail, 2.10; difference of tail feathers, .25; difference of 10th and longest quills, .25; exposed portion of 1st primary, .85, of 2d, 1.38, of longest (4th) (measured from exposed base of 1st primary), 1.63; length of bill from forehead, .55, from nostril, .32, along gape, .64; tarsus, .77; middle toe and claw, .55; claw alone, .20; hind toe and claw, .48, claw alone, .24.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
38,924	69	♀	Panama.	Jan. 7, '65.	Fred. Hicks.	.....
38,925	72	♂	"	"	"	.....
..	176	♀	"	...	Cab. Lawrence.	M'Lean. & Galb.

(38,924.) Eyes white; legs and bill slightly pinkish. (176.) Type.

Hylophilus decurtatus.

Sylvicola decurtata, BON. P. Z. S. 1837, 118 (Guatemala).—*Pachysylvia decurtata*, BON. Consp. 1850, 309.

Hylophilus cinereiceps, SCLATER & SALVIN, P. Z. S. 1860, 299 (Vera Paz, Guat.).—IB. Ibis, 1860, 397 (Guat.).—? IB. P. Z. S. 1864, 348.—SCLATER, Catal. 1861, 44, no. 267.

Hab. South Mexico and Guatemala.

(No. 22,374, ♂.) Wing considerably graduated; 2d quill about equal to 10th; 5th longest; exposed portion of 1st less than half 3d, more than half 2d. Tail short, rather rounded; feathers narrow.

Above bright olive green; whole top of head and nape clear pure ash gray, in sharp contrast; cheeks paler, whitish about eyes. Beneath white, with a slight creamy tinge, purest on throat and belly; the sides of breast and flanks yellowish olive, lighter than the back, passing more into yellow on crissum, and still purer yellow on inside of wings and axillars. Quills dusky brown, edged externally with olive green, the outer primaries only with gray; quills edged internally with whitish. Tail feathers olive. Bill above dusky, whitish below. Legs dusky?

(No. 22,374, ♂.) Total length, 3.75; wing, 2.10; tail, 1.80; difference of feathers, .14; difference of 10th and longest quills, .34; exposed portion of 1st primary, .71, of 2d, 1.35, of longest (5th) (measured from exposed base of 1st primary), 1.62; length of bill from forehead, .56, from nostril, .32, along gape, .63; tarsus, .64; middle toe and claw, .43, claw alone, .16; hind toe and claw, .36, claw alone, .20.

The loral region and a narrow ring around the eye are grayish-white, as is to a less extent the space below the eye.

This species is almost certainly the *Pachysylvia decurtata* of Bonaparte.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,374	..	♂	Mexico (Cordova?)	...	Verreaux.	.....
24,163	..	..	Guatemala.	...	G. N. Lawrence.	.....
..	172	♂	"	...	Cab. Lawrence.	.....
..	402	..	"	...	"	.....
..	403	♂	"	...	"	.....

Hylophilus pusillus.

Hylophilus pusillus, LAWRENCE, Ann. N. Y. Lyc. VII, 1861, 323 (Panama); VIII, 1865, 180 (Greytown, Nic.).

Hab. Isthmus Panama, to southeastern Nicaragua.

Very similar to *decurtatus*, but smaller; ash of head not extending as far back over the nape, and slightly mixed with olive; less distinct on side of neck; tail beneath more olive. Olive of sides less in amount, and more yellow. Back more yellow. "Iris brown." *Carmiol.*

(No. 400, Panama.) Total length, 3.80; wing, 2.05; tail, 1.60; difference of 10th and longest primaries, .27; exposed portion of 1st primary, .70, of 2d, 1.32, of longest (5th) (measured from exposed base of 1st primary), 1.60; length of bill from forehead, .60, from nostril, .34, along gape, .64; tarsus, .60.

(No. 34,672, ♂, Costa Rica.) Total length, 3.70; wing, 1.85; tail, 1.40; difference of 10th and longest primary, .16; exposed portion of 1st primary, .62, of 2d, 1.12, of longest (5th) (measured from exposed base of 1st primary),

1.40; length of bill from forehead, .55, from nostril, .34, along gape, .62; tarsus, .60.

The comparison of many specimens of the grayheaded *Hylophilus* of Guatemala, with others from Panama, exhibits, on the whole, the differences referred to, as stated by Mr. Lawrence, but they are exceedingly slight, and may not unreasonably be referred to the influence of season or locality. Of the three types of Mr. Lawrence, two, in which the olive green of the cap is most distinct, and the size least, are decidedly immature birds; the third (No. 400), however, is adult, and although the color referred to is reduced in amount, it is still quite appreciable.

Unmistakably adult specimens from Costa Rica and Nicaragua are still smaller than those from Panama, as shown by the measurements given above. They are even brighter yellowish above than in the type, the edges of some of the feathers almost yellow. Compared with Guatemalan skins of unmistakable *decurtatus*, the difference is very appreciable.

A young bird, scarcely full fledged, has the olive of back soiled with buff, the top of head is dull sepia brown, and the olive of back is tinged with the same.

I am not satisfied as to the existence of more than one species, but for the present retain *pusillus*, and await further evidence to determine the question.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
37,366	69	♀	San Juan, Nic.	1865.	H. E. Holland.	.....
39,754	..	♂	Santa Rosa, C. R.	Jan. 4, '65.	J. Carmiol.	.....
34,671	..	♂	Angostura, C. R.	June 10, '64.	"	.....
34,672	..	♂	"	June 8, '64.	"	.....
34,673	..	♀.	"	June 12, '64.	"	.....
35,242	..	♀	Dota, C. R.	July 22, '64.	"	.....
..	400	♂	Panama.	...	Cab. Lawrence.	M'Lean. & Galb.
..	401	♀	"	...	"	"
..	174	♂	"	...	"	"

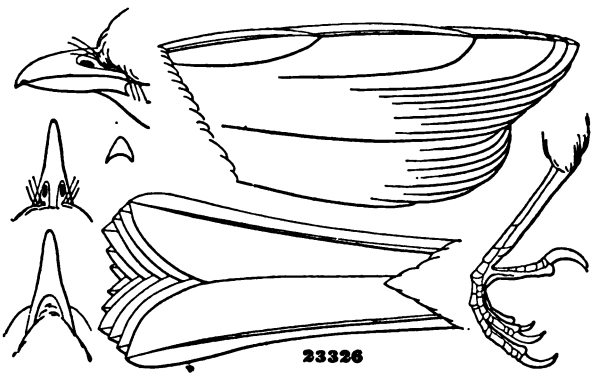
(400.) Type. (401.) Type. (174.) Type.

LALETES, SCLATER.

Laletes, SCLATER, P. Z. S. 1861, 72. (Type *L. osburnii*.)

General appearance that of a *Vireo*. The rather pointed wings, are longer than the narrow, nearly even, slightly rounded tail. First primary about half the second, which about equals secondaries; the 4th quill longest. Bill deep and much compressed from base; depth two-thirds the distance from nostril to tip. Culmen straight for basal third, then decurving hooked, deeply notched bill; gonys also curv[illegible] [illegible]issure slig[illegible] Nostrils

rather large and oval, anterior, with membrane above and behind. Frontal feathers directed slightly forward, with few bristles. Sides of upper bill with



Laletes osburnii, SCLATER. (Jamaica.)

slight furrows parallel to culmen. Legs large; the feet stouter, the claws longer than in *Vireo*. The hind toe is especially more developed; the comparative length of lateral toes, however, and their adhesion, much as in *Vireo*.

This genus somewhat resembles *Cyclorhis* in the deep bill, but differs in weaker claws, the inner lateral one not reaching beyond the base of the middle. The much higher and more compressed bill, with its longitudinal furrows; the larger toes, the hinder one much longer in proportion, separate it from *Vireo*. It forms a connecting link between the Vireos and *Cyclorhis*.

Laletes osburnii.

Laletes osburnii, SCLATER, P. Z. S. 1861, 72. (Jamaica.)
Olive Chatterer. (Jamaica.)

Hab. Jamaica.

(No. 23,326, ♂.) Wings rather pointed, longer than the nearly even tail. First quill about half 2d, which is not quite equal to the secondaries; 4th and 5th quills longest.

Above olive green, brightest on rump; head above and on sides tinged with ashy. Beneath yellow; breast, flanks, and crissum more olivaceous, throat paler; inside of wings and inner edges of quills creamy white, as are the loral feathers at their base. Concealed portion of quills fuscous brown, of tail feathers more olive. Bill blackish; tomia and tip paler; legs flesh color?

(No. 23,326, ♂.) Total length, 5.40; wing, 2.80; tail, 2.65; difference of 10th and longest quills, .42; exposed portion of 1st primary, .85, of 2d, 1.65, of longest (5th) (measured from exposed base of 1st primary), 2.20; length of bill from forehead, .66, from nostril, .36, along gape, .73, depth, .23; tarsus, .83; middle toe and claw, .68, claw alone, .24; hind toe and claw, .56; claw alone, .26.

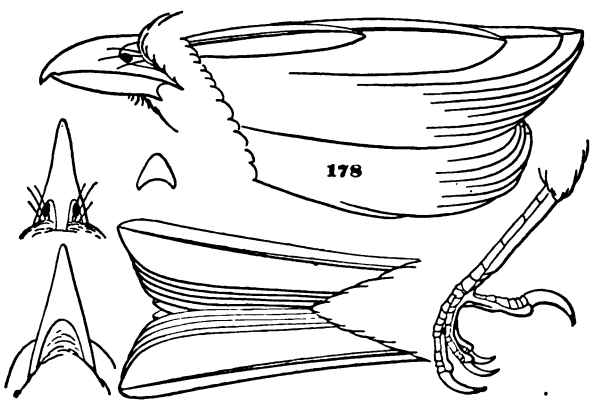
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,326	87	♂	Trelawney, Jam.	Jan. 31, '59.	Dr. Sclater.	W. Osburn.

(23,326.) Type.

CYCLORHIS, SWAINSON.

Cyclorhis, SWAINSON, Zool. Journal, III, 1828, 162. (Type *Tanagra guianensis*, GM.)

Form very stout; the head broad. Wings rather longer than the narrow, nearly even, or slightly rounded tail; the quills graduated: the 1st more than



Cyclorhis guianensis, SCLATER. (Cayenne.)

half the 2d, which about equals secondaries; the 4th or 5th longest; the tips not attenuated. Bill very powerful, deep, much compressed (depth almost equal to distance from nostril to notch of bill); culmen and gonys much curved from base; gape nearly straight; tip of upper bill decurved and with deep notch; tip of lower less distinctly marked. Nostrils small, nearly circular, in anterior end of nasal fossa, with membrane above and behind it. Frontal feathers directed somewhat forward, but not overhanging nostrils, and with very few bristles; those of rictus moderate.

Feet stout (rather less so than in *Dulus*). Tarsus rather longer than middle toe and claw; distinctly scutellate anteriorly, and with one or two divisions externally at lower end. Basal joint of middle toe entirely adherent externally to one and a half joints of outer; internally, but slightly free and united to half of adjacent joint. Lateral toes nearly as long as middle, reaching over half the length of middle claw or even farther. Hind toe longer than the lateral. Claws all very stout and sharp, much curved.

The bill of *Cyclorhis*, in its compression, great der other

characters, is very similar to that of *Falcunculus* (of the *Laniadæ*) of Australia, which it also resembles so much in other characters as usually to induce authors to bring the two together, either as adjacent genera, or as belonging to closely allied subfamilies.

The difference generically between *Cyclorhis* and *Vireolanius* is very slight, and I cannot find any real ground of separation. In the latter the bill is perhaps lower and proportionally more elongated; the culmen less curved; the tip longer and more curved, although *C. nigrirostris* differs from the other species of *Cyclorhis* in just these characters. The nostrils are perhaps more circular and smaller in *Cyclorhis*. The colors differ somewhat—the prevailing tints in *Cyclorhis* being olive green and dull yellow, as in the Vireos, while in *Vireolanius* they are deep verdigris green, bright blue and clear yellow (white below in type). If we were to limit *Vireolanius* to the type—*melitophrys*—the difference would be rather more appreciable. For the present, however, I keep the two groups separate.

Although most of the species of the two genera are strictly South American, I yet give all in detail, in order to furnish a complete monograph of the family of *Vireonidæ*.

COMMON CHARACTERS.—Above plain olive green; lower throat (sometimes breast, or whole under parts), axillars, inner face of wings, and inner edges of quills yellowish; rest of under parts whitish. A rufous band from nostrils over eye to nape, sometimes only to eye. Chin, and more or less of cheeks, ashy. Head above ashy, more or less pure, rarely like the back. Lower mandible in most species plumbeous black.

A. Head above and nape, with the entire cheeks, ash color; the former sometimes glossed with ochraceous.

Legs flesh color. Throat, jugulum, and breast yellow.

Entire under parts (except chin) yellow . . . *flaviventris.*[1]

Beneath yellow; middle of belly to crissum whitish.

Yellow more extended, with decided olivaceous green tinge across the breast. Cheeks dark ash . . . *subflavescens.*

Yellow of breast more restricted, and scarcely olivaceous. Cheeks light ash . . . . . *flavipectus.*

Legs dusky plumbeous. Lower throat and sides of breast yellowish.

Superciliary rufous extending to nape. Lower mandible plumbeous at base.

[1] Specimens from Guatemala lack the black spot of bill.

Head above nearly pure ash. Second quill shorter than 10th . . *guianensis.*[1]
Head above washed with ochraceous. Second quill longer than 10th. Size larger . . . . . *viridis.*
Superciliary rufous reaching only to eye. Lower mandible weak; flesh color.
Head above strongly washed with ochraceous . . . . . *ochrocephala.*

B. Vertex and nape olive green, like the back; cheeks and jugular band, with sides of breast, yellowish, or olive green. Legs flesh color? Lower mandible dusky.
Forehead chestnut brown, this color extending backward to the nape as a superciliary band. Cheeks and jugulum yellowish. Upper mandible pale *virenticeps.*
Forehead plumbeous, with a dark chestnut band from nostrils to eye only. Cheeks and jugulum olivaceous. Upper mandible black . . *nigrirostris.*

Of the species described, *C. subflavescens* and *C. viridis* are those which have least strongly marked distinctive characters.

In examining the preceding analytical arrangement of the species of *Cyclorhis* some interesting geographical considerations present themselves. The most northern species (*C. flaviventris*) exhibits most yellow beneath, this diminishing progressively in more southern species, as *C. subflavescens* (Costa Rica), and *C. flavipectus* (northern part of South America). All these more northern species have pale-colored legs, while those of Eastern South America have dusky legs, and like those just mentioned have the vertex and nape, with whole cheeks, more or less ash, in decided contrast to the back. The two Andean, on the contrary, have these parts like the back. All the species, as a rule, have the under mandible plumbeous black at the base, caused by the deposit of a black pigment on the bone; this is only exceptionally absent except in *ochrocephala*, where it seems never to occur. In all, the upper mandible is pale in the dried skin; said sometimes to be red in life; in *nigrirostris* only is it black. The iris is said in most species to be either red or yellowish.

Cyclorhis flaviventris.

Cyclaris flaviventris, Lafr. Rev. Zool. 1842, 133 (Santa Cruz, Mex.).—*Cycloris fl.* Bon. Consp. 1850, 330.—*Cyclorhis fl.* Sclater, P. Z. S. 1856, 99; 1858, 448; 1859, 363 (Jalapa); 1864, 173 (City of Mexico).

[1] Specimens from Ceara, Brazil (perhaps autumnal), have yellow extending over the breast, much as in *flavipectus*, but with dusky legs, the vertex tinged with ochraceous.

—Ib. Catal. 1861, 45, no. 276.—? Sclater & Salvin, Ibis, I, 1859, 13 (Guatemala).—*Cyclorhis fl.* Tschudi, Archiv Naturg. 1845, 363 (Mexico).

Hab. Southern Mexico and Guatemala.

(No. 37,498, ♂.) Upper part and sides of head, with nape, ashy, with a broad stripe of rufous brown from each nostril (the two confluent anteriorly) over and beyond eye to nape (the eye considerably anterior to the middle of the stripe); rest of upper parts olive green. Chin very pale ashy; rest of inferior surface, with inside of wings, bright yellow. Upper mandible pale; lower, plumbeous black, the end whitish. Legs apparently flesh color. "Iris cherry red." Second quill shorter than the 10th; 3d less than the 7th.

(No. 37,498, ♂.) Total length, 6.10; wing, 3.25; tail, 2.95; exposed portion of 1st primary, 1.25, of 2d, 2.00, of longest (5th) (measured from exposed base of 1st primary), 2.55; length of bill from forehead, .85, from nostril, .50, along gape, .85, depth, .37; tarsus, .92; middle toe and claw, .75, claw alone, .30; hind toe and claw, .68, claw alone, .34.

In the specimen described, and in fact in all before me, there is a faint wash of ochraceous on the vertex, though in several, as No. 30,874, the color of the ash is nearly pure. In this same specimen the ochrey color of the forehead extends over the lores, and involves the lower eyelids to a greater degree than usual. The ash of the chin is much restricted—being limited to the space between the rami.

There is not much variation in the extensive series before me. The yellow is sometimes deeper in spring specimens; in autumnal it is paler, with a slight buffy tint. It is somewhat remarkable, however, that of four Guatemalan skins in the collection, three should lack the black of the lower jaw. The fourth, from Coban, a locality nearest of all to Mexico and Yucatan, is as described above. I can detect no other difference. All other specimens have the dark spot in question.

The uniform yellow of the under parts sufficiently distinguishes this species from all its allies.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
37,498	58	♂	Orizaba, Mex.	Jan. 28, '65.	Prof. Sumichrast.	.....
37,499	21	..	"	Jan. 6, '65.	"	.....
38,162	91	..	"	...	M. Botteri.	.....
30,874	120	..	Mirador, Mex.	Mar. 1863.	Dr. Sartorius.	.....?
30,873	120	..	"	"	"	.....
37,915	192	♀	Merida, Yuc.	Feb. 19, '65.	Gov. Salazar.	Dr. Schott.
37,916	191	♀	"	"	"	"
37,917	193	♀	"	"	"	"
39,279	495	♂	"	May 23, '65.	"	"
22,372	32,615	..	Coban.	...	Verreaux.	.....
39,169	..	..	Guatemala.	...	J. Gould.	.....
..	180	♂	"	...	Cab. Lawrence.	.....

(37,499.) Iris brown; bill and feet flesh color. (30,874.) Eyes cherry red. (30,873.) Do.

Cyclorhis subflavescens.

Cyclorhis subflavescens, CAB. Journ. für Orn. 1860 (May, 1861), 405 (Costa Rica; September); 1861, 93 (spec. without dusky spot on bill).—SCLATER, Catal. 1862, 359, No. 276*.

Hab. Costa Rica.

(No. 34,669, ♀.) Upper part and sides of head, with the nape and the chin, ash color; the vertex soiled with rufous olive. A broad rufous band from each nostril over and behind the eye (the two confluent anteriorly), which is anterior to its middle point. Rest of upper parts olive green. Whole throat and breast greenish-yellow, the flanks and inner lining of wings purer yellow, as also to some extent a tinge on the crissum. Middle of belly white. Bill pale above; lower jaw dark plumbeous, with whitish tip. Legs flesh color. "Iris yellowish" (*Carmiol*).

Second quill shorter than 10th; 3d about equal to 8th.

(No. 34,669, ♀.) Total length, 6.00; wing, 2.95; tail, 2.50; exposed portion of 1st primary, 1.15, of 2d, 1.85, of longest (5th) (measured from exposed base of 1st primary), 2.30; length of bill from nostril, .42, along gape, .80, depth, .33; tarsus, .86; middle toe and claw, .66, claw alone, .27; hind toe and claw, .64, claw alone, .30.

Specimens differ in the amount of yellow on the under parts, which are sometimes entirely yellow (though paler behind), with the middle of belly only white; in other instances the middle of breast, belly, and the crissum are white. The flanks, however, are always yellow. Autumnal specimens show a buffy tinge in the white. Of the six specimens examined, all have the plumbeous spot on the bill.

This species is easily distinguished from *flaviventris* by its whitish belly. It is most closely related to *C. flavipectus* in its flesh colored legs and yellow breast, and in fact it is somewhat of a question whether they are specifically distinct. The Costa Rica bird is rather larger, and less brilliantly colored; the ash of the head is darker; the yellow of breast more olivaceous, and perhaps extending a little farther back. The ochraceous wash of the hood is more marked, although both species vary among themselves in this as well as the other points. Better skins than those before me may, however, exhibit the differences more satisfactorily.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
35,239	..	♂	Dota, C. R.	July 27, '64.	J. Carmiol.	Iris yellow.
33,295	..	..	San Jose, C. R.	...	"	Iris red.
34,669	..	♀	"	April 4, '64.	"	Iris light yellow.
30,506	111	..	"	...	Dr. v. Frantzius.	.....
30,507	112	..	"	...	"	.....
34,670	..	♀	Barranca, C. R.	April 17, '64.	J. Carmiol.	Iris yellow.

Cyclorhis flavipectus.

Cyclorhis flavipectus, SCLATER, P. Z. S. 1858, 448 (Trinidad and Santa Martha).—IB. Catal. 1861, 45, no. 275.—TAYLOR, Ibis, 1864, 81 (Trinidad).

Hab. Trinidad and northern coast of South America.

(No. 32,719, ♂.) Head above, and nape, light plumbeous, washed very faintly with orange or ochrey brown; cheeks paler, and pure ashy, running into the still lighter, almost white chin; rest of upper parts bright olive green. Throat and breast (extending down a little more along the sides) bright greenish-yellow; the inner face of wings and inner edges of quills purer yellow. Rest of under parts white. Under surface of tail decided olive green. A broad superciliary band of orange or ochrey brown from nostrils (the two meeting on the forehead) reaching to the nape, rather farther beyond the eye than the distance to it. Bill horn color, the tip and edges whitish; the lower mandible plumbeous black. Legs flesh color.

Fourth and 5th quills equal and longest; 2d shorter than the 10th and the secondaries.

(No. 32,719, ♂.) Total length, 6.00; wing, 2.80; tail, 2.60; exposed portion of 1st primary, 1.05, of 2d, 1.75, of longest (measured from exposed base of 1st primary), 2.16; length of bill from forehead, .75, from nostril, .46, along gape, .83, depth, .36; tarsus, .88; middle toe and claw, .72, claw alone, .30; hind toe and claw, .61, claw alone, .34.

The extreme nape is of a purer plumbeous than elsewhere on top of the head. No. 32,719 has a faint buff wash on the sides of body not seen in the others, and probably indicative of the autumnal plumage.

This species is readily distinguished from *C. guianensis*, which it otherwise resembles, by the yellow, not dusky legs: the greater amount of yellow beneath, which extends over the jugulum to fore part of breast: and the ochrey wash of top of head, although this latter character may depend somewhat on season. The ash of cheeks and chin is lighter, the yellow of under parts purer. The size is larger, the bill deeper; the legs stouter, besides being differently colored. There is less of the gray tinge of the under parts of *guianensis*.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,719	21,167	♂	Santa Martha.	...	Verreaux.	.....
30,600	..	..	Trinidad.	...	M. Galody. [ton.	.....
..	..	..	"	...	Cab. A. & E. New-	.....

Cyclorhis guianensis.

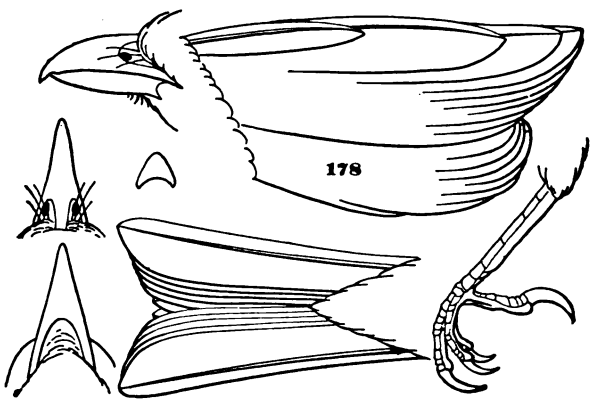
Tanagra guianensis, GM. I, 1788, 893 (*Verderoux*, BUFFON, Hist. Nat. Ois. IV, 272, Guiana).—?*Cyclorhis guianensis*, BURM. Uebers. III, 1856, 106 (describes the var. from Ceara, with yellow breast).—

Cyclorhis g. SCLATER, P. Z. S. 1858, 448 (Cayenne, etc.).—IB. Catal. 1861, 45, no. 274.

Cyclorhis poliocephala, TSCHUDI, Wieg. Arch. 1845, 363 (N. Brazil and Guiana).—(? Not of Fauna Peruana, 169).

Hab. Guiana (and eastern Brazil ?).

(No. 178, ♂, Cab. G. N. Lawrence, Cayenne.) Head (including cheeks and chin) and nape clear pure light plumbeous, the chin considerably paler. Rest



Cyclorhis guianensis, SCLATER. (Cayenne.)

of upper parts unvaried olive green, continuous with a rather narrow band across the lower part of the throat and extending on side of breast, which are of more yellowish olive. Inside of wings, axillars, and inner edges of quills yellow. Remaining under parts grayish, the median line and lower belly white. Longer crissal feathers tinged with olive. A broad orange brown stripe from nostrils (where it meets its fellow and forms a frontal band) over and beyond the eye to the nape, the eye placed a little anterior to the middle of the band. Bill horn color; the lower mandible, except at tip, blackish-plumbeous. Legs dusky.

Exposed portion of 1st quill more than half that of the 2d, which is rather shorter than secondaries; 4th and 5th quills longest.

The band across the lower throat scarcely involves the jugulum, and is a little more than half an inch wide. The flanks and tibiæ are grayish, without any wash of olive. The under surface of tail is decidedly olive green.

(No. 178.) Total length, 5.25; wing, 2.75; tail, 2.50; exposed portion of 1st primary, 1.00, of 2d, 1.70, of longest (4th) (measured from exposed base of 1st primary), 2.05; length of bill from forehead, .71, from nostril, .45, along gape, .80; depth, .32; tarsus, .83; middle toe and claw, .64, claw alone, .26; hind toe and claw, .56, claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	178	♂	Cayenne.	...	Cab. Lawrence.	.....

In the collection before me are two specimens from Ceara, Brazil, which differ in having the yellow extending on the front and sides of the breast almost as much as in *flavipectus;* the rest of under parts, except the middle of belly, with a decided buff tinge, the crissum and tibiæ more yellowish. The head above is washed with ochraceous; thus, in most respects, very similar to *flavipectus*, but with dusky legs. The latter character distinguishes them at once from *flavipectus*. They are rather larger than the specimen described above of *C. guianensis*, and differ otherwise, as stated, but agree in the dusky legs. If the same species, they may be in autumnal plumage. A specimen from Bahia (thus likewise from the easternmost part of Brazil) is quite similar. Additional specimens may prove it to be distinct from *guianensis*. (*C. cearensis*, Bd.)

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	179	..	Bahia.	...	Cab. Lawrence.	.....
36,693	..	..	Ceara, Brazil.	...	Nat. Hist. Mus. Rio.	.....
36,694	..	..	"	...	"	.....

Cyclorhis ochrocephala.

Cyclorhis ochrocephala, Tschudi, Arch. f. Naturg. 1845, I, 362 (south Brazil; Buenos Ayres).—*Cyclorhis och.* Sclater, P. Z. S. 1858, 448.—Ib. Catal. 1861, 45, no. 277.

Cyclorhis guianensis, Sw. Orn. Bras. pl. 58.

Cyclorhis viridis, Cab. Mus. Hein. I, 1850, 64 (S. Brazil; Paraguay).—*Cyclorhis vir.* Burm. Uebers. III, 1856, 107 (southern Brazil).

Hab. Southern Brazil.

(No. 21,018, ♂,) Head above, and nape, ashy, but usually washed so continuously with ochrey brown as entirely to conceal the ground color; rest of upper parts olive green. Cheeks, lores, and side of nape pure ashy; chin paler. Forehead ochrey brown, extending in a narrow line along the upper eyelid, but not beyond it; the contrast with rest of crown not abrupt. Lower throat, the upper part of jugulum, and the sides of the breast greenish-yellow; the inside of wings and inner edges of quills purer yellow. Under parts buffy white, purer white in middle of belly. Under surface of tail olive brown rather than olive green. Bill horn color; lower mandible paler, without trace of plumbeous black spot. Feet dusky plumbeous, almost black. First quill less than half the longest; 3d intermediate between 8th and 9th; 2d less than the 10th or the secondaries.

(No. 20,018, ♂.) Total length, 6.30; wing, 3.20; tail, 3.00; exposed portion of 1st primary, 1.05, of 2d, 1.85, of longest (5th) (measured from exposed base of 1st primary), 2.40; length of bill from forehead, .72, from nostril, .42, along gape, .80, height, .33; tarsus, 1.00; middle toe and claw, .75, claw alone, .29; hind toe and claw, .69, claw alone, .32.

Another specimen has the color of under parts purer, with less buff. Another from Rio (No. 18,571), likewise with less buff beneath, has the vertex showing a considerable amount of plumbeous. The back is somewhat tinged with ochraceous in the type specimen.

This species agrees with *guianensis* in dusky legs and the restriction of the yellow to the lower throat and extreme upper part of the jugulum. It is, however, larger; the bill lower, without trace of the blackish spot; the ochrey band of forehead extends in a very narrow line only along the upper eyelid, instead of broadly reaching the nape, and the vertex is washed with ochrey, so as almost or entirely to cover the plumbeous or ashy of the feathers. The under surface of the tail shows less olive green.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,571	..	..	Rio Janeiro.	...	P. L. Sclater.	.....
23,921	..	..	Brazil.	...	Dr. Horner.	.....
15,182	P. 461 / C. 151	..	"	...	Expl. Exped.	.....
21,018	70	♂	Tigre, Brazil.	July, 1860.	Capt. T. J. Page.	Chr. Wood.
..	181	..	S. America.	...	Cab. Lawrence.	.....

Cyclorhis viridis.

Saltator viridis, VIEILL. Nouv. Dict. XIV, (1817) 108.—IB. Encycl. Méth. II, 1823, 793 (based on *Habia verde*, AZARA, Apunt. I, 301) (Paraguay).—? *Cyclorhis viridis*, SCLATER, P. Z. S. 1858, 448 (Bolivia).—IB. Catal. 1861, 46, no. 280 (not of CABANIS and BURMEISTER).

Hab. La Plata and Bolivia?

(No. 20,976, ♀, Parana.) Head above ashy, almost concealed by a gloss of reddish-brown; rest of upper parts olive green. Chin, lores, cheeks, and sides of nape pale ash. Forehead ochrey brown, this color extending narrowly above and beyond the eye to the nape. Lower part of throat and sides of breast, with insides of wings, pale yellow; the flanks washed with the same; rest of under parts soiled white. Bill rather dusky; under mandible somewhat darker, but without a distinct spot as in *guianensis*. Legs dark plumbeous. First quill much more than half the longest; 2d between 8th and 9th; 3d but little shorter than 4th, which is longest, about equal to 5th.

(No. 20,976, ♀.) Total length, 6.00; wing, 3.00; tail, 3.00; exposed portion of 1st primary, 1.25, of 2d, 1.95, of longest (4th and 5th) (measured from exposed base of 1st primary), 2.25; length of bill from forehead, .75, from nostril, .45, along gape, .80, depth, .37; tarsus, 1.00; middle toe and claw, .72, claw alone, .29; hind toe and claw, .69, claw alone, .32.

I have referred to the *C. viridis*, of Vieillot, based on a description by Azara, a specimen from the Parana, a region sufficiently near that of Azara's bird for the two to be identical, and agreeing

sufficiently with the account of the latter author. It is of much the same size as *C. ochrocephala*, but differs primarily in having the brown superciliary stripe pass beyond the eye to the nape, as in *guianensis*, though it is narrower and less distinct. The brown wash on the head is less than in *ochrocephala;* the yellow on the throat less extensive. The bill is higher, and the under mandible more dusky, though not blackish. The first and second quills are longer, the former more than half the longest, not less; the second longer than the tenth, in this respect differing from the other S. American species.

From *guianensis* the species can be distinguished by its much larger size; the wing formula; the ochraceous wash of the head; less amount of yellow on throat (?), etc.

A specimen from Bolivia (No. 280*a*), kindly lent by Dr. Sclater, and labelled by him *C. viridis*, agrees with that above described in general features. It is rather larger: wing, 3.30, the outer quills not quite so long, and the lower mandible with a very conspicuous black spot.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
20,976	70	♂	Parana.	April 1860.	Capt. T. J. Page.	Chr. Wood.
..	280*a*	..	Bolivia.	...	Cab. Sclater.	.....

Cyclorhis virenticeps.

Cyclorhis virenticeps, SCLATER, P. Z. S. 1860, 274, pl. 164 (Babahoyo, Ecuador).—IB. Catal. 1861, 46, no. 278.

Hab. Babahoyo, Ecuador.

(No. 278*a*.) Whole upper parts, including vertex, bright olive green. A broad, rufous, almost chestnut brown band from the nostrils (meeting on the forehead) passing over and beyond the eye to the nape. Chin, lores, and sides of lower mandible ashy; rest of cheeks, entire throat, upper part of jugulum, sides of breast and inner face of wings, with inner edges of quills, yellow. Rest of under parts white, soiled with buff, except along the middle of belly. Upper mandible pale horn color; lower plumbeous black, except at the tip. Legs apparently flesh color. "Iris hazel" (*Fraser*).

(No. 278*a*.) Total length, 6.00; wing, 2.95; tail, 2.65; length of bill from forehead, .76, from nostril, .44, along gape, .76, depth, .33; tarsus, .90; middle toe and claw, .70, claw alone, .26; hind toe and claw, .65, claw alone, .32.

The type specimen of this species, kindly supplied by Dr. Sclater, is moulting some of the wing feathers, so that the quill formula cannot be accurately given. The supra-ocular stripe extends farther behind the eye than in front of it, and the lower eyelid appears to

have a line of feathers of the same colour as in the other species. The bill is stout and deep, and the culmen much curved.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	278*a*	..	Babahoyo, Ecuad.	...	Cab. P. L. Sclater.	Fraser.

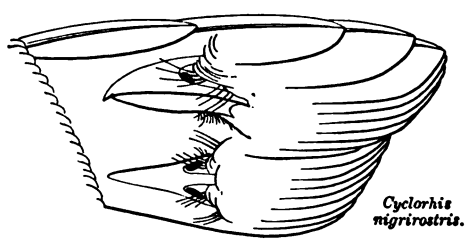
(278*a*.) Type.

Cyclorhis nigrirostris.

Cyclaris n. LAFR. Rev. Zool. 1842, 133 (Colombia).—IB. Mag. de Zool. 1843, pl. 33.—*Cycloris n.* BON. Consp. 1850, 330.—*Cyclorhis nig.* SCLATER, P. Z. S. 1855, 151; 1858, 448.—IB. Catal. 1861, 46, no. 280 (Bogota).

Hab. Bogota.

(No. 279*a*.) Above olive green, with a short stripe from each nostril (not confluent anteriorly) of dark orange brown, extending over and beyond the eye, for a considerably less distance than anterior to it. A frontal band (extending faintly along side of vertex), lores, cheeks below, and a little behind the eye, chin, and most of the throat and breast ashy, paler below, and passing behind into soiled buffy gray. Sides of neck and the ears, continued into a narrow, almost interrupted band across the upper part of jugulum, the sides of breast, and more faintly the flanks, olive green, but little paler than the back. Inner wing coverts, axillars, and inner edges of quills yellow. Bill entirely blackish, except at base of lower mandible, where it appears to be flesh color. Legs quite pale, though hardly flesh color.



Cyclorhis nigrirostris.

The bill is lower and the culmen straighter than in other species, and has the exclusive character of black maxilla. The first quill is less than half the longest; the 2d less than the 10th; the 3d about equal to the 8th; the 4th and 5th longest.

(No. 279*a*.) Total length, 5.50; wing, 3.10; tail, 2.65; exposed portion of 1st primary, 1.00, of 2d, 1.75, of longest (4th and 5th) (measured from exposed base of 1st primary), 2.30; length of bill from forehead, .75, from nostril, .44, along gape, .80, depth, .30; tarsus, .90; middle toe and claw, .70, claw alone, .28; hind toe and claw, .66, claw alone, .30.

Of two specimens I have had the opportunity of examining, the one serving as the basis of my description has been presented by Dr. Sclater. The other, in the ... Philadelphia ...

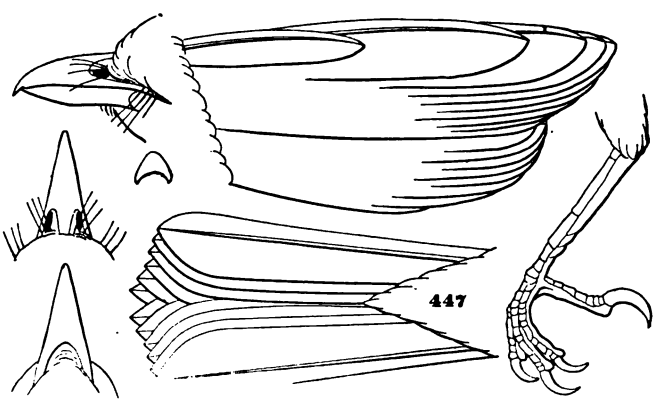
is quite similar, but with a shorter bill. The species is nearest in its relationships to *C. virenticeps*, but differs in the black maxilla; the light base of the lower mandible; the ashy frontal band (seen indistinctly on the side of vertex); the much darker, and shorter supra-ocular stripe; the olive green of under parts instead of yellow, and of much less extent; the ashy region behind the eyes, etc.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	279*	..	Bogota.	...	Cab. Sclater.	.....
..	..	..	"	...	Mus. Phila. Acad.	.....

VIREOLANIUS, Dubus.

Vireolanius, "Dubus," Bon. Consp. 1860, 330. (Type *V. melitophrys*, Dubus.)

This group of birds agrees in all essential generic characters with *Cyclorhis*, especially in the shape and structure of bill, adhesion



Vireolanius melitophrys, Dubus. (Guatemala.)

and length of toes, shape of wings, tail, etc., and it is a question whether they should not be united. The only difference is in a rather less amount of curvature of culmen than in most species, and a rather less depth of bill; although in this respect *C. nigrirostris* agrees exactly with *Vireolanius*. The legs are perhaps less stout. The pattern of coloration is quite the same. The type differs most from *Cyclorhis*, and at the same time from the other species associated with it in *Vireolanius*, in having the tail rather longer than the wings, not shorter.

COMMON CHARACTERS.—Top of head and nape either bright blue or lead color, in abrupt contrast to the uniform deep green of the rest of upper parts. Bill blackish.

A. Beneath white, with rufous pectoral band. Legs yellow.
  Head above and nape bright blue.
    A band above eye, and spot below it, yellow.
      A line through the eye, and one from lower edge of lower mandible, black . *melitophrys.*

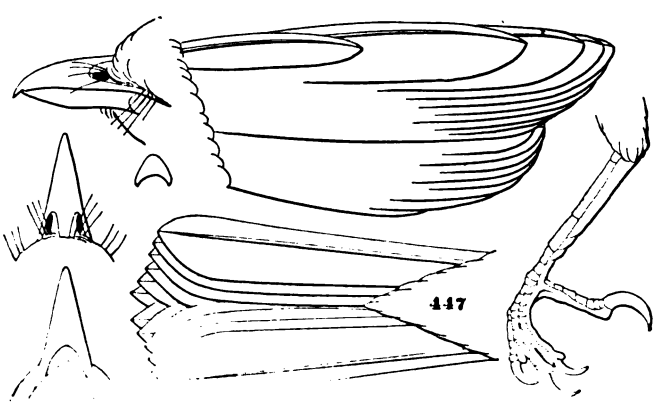
B. Beneath olivaceous or yellowish, without bands. Throat yellow. Legs dusky.
  Head above and nape bright blue. Sides of head green, like back. Beneath olivaceous.
    A well marked yellow supra-ocular line and infra-ocular spot . . . . . *eximius.*
    No distinct line nor spot as above . . . . *pulchellus.*
  Head above and nape lead color. Sides of head without green like the back. Beneath yellowish. A supra-ocular line and infra-ocular spot of yellow.
    An ocular and a subocular blackish plumbeous band, with white interspace behind. Beneath yellowish . . . . . *icterophrys.*
    Sides of head nearly uniform plumbeous, the markings indicated above very obsolete. Beneath olivaceous . . . . . *chlorogaster.*

Vireolanius melitophrys.

Vireolanius melitophrys, "DUBUS MS.," BON. Consp. 1850, 330 (Mexico). —SCL. P. Z. S. 1857, 213; 1859, 363.—IB. Catal. 1861, 45, no. 271.

Hab. Southern Mexico and Guatemala.

(No. 447.) Back and upper surface of wings and tail bright olive green; head above and nape ash color; under parts and sides of head and neck below



Vireolanius melitophrys, DUBUS. (Mexico and Guatemala.)

the eyes white. A broad gamboge yellow stripe from bill, above and beyond the eye; a black band from commissure of bill across lower half and behind the eye (apparently widening and abruptly truncated behind), and a much less conspicuous black line from lower corner of the gonys, the two nearly parallel, and coextensive with the superciliary yellow (the lower one cutting off an infra-ocular white stripe). A well defined band of rufous brown across the breast, the sides of body suffused with the same. Primaries edged externally with whitish near the ends. Quills edged internally with yellowish. Crissum and inner wing coverts white. Bill black; legs yellow.

(No. 447.) Total length, 6.00; wing, 2.85; tail, 3.00; exposed portion of 1st primary 1.00, of 2d, 1.80, of longest (5th) (measured from exposed base of 1st primary), 2.22; length of bill from forehead, .85, from nostril, .45, along gape, .90; tarsus, .95; hind toe and claw, .60, claw alone, .30.

The upper part of head is slightly glossed with olive. The bases of the yellow feathers in front of the eye are white. The lower half of the orbital region is crossed by the black ocular stripe, the upper by the yellow. The ocular yellow and black stripes extend as far behind the eye as in front of it.

For the opportunity of examining this species I am indebted to Mr. Salvin.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	447	..	Volcan de Fuego, [oak forest, Guat.	Sept. 18, '59.	Cab. Salvin.	Salvin & Godman.

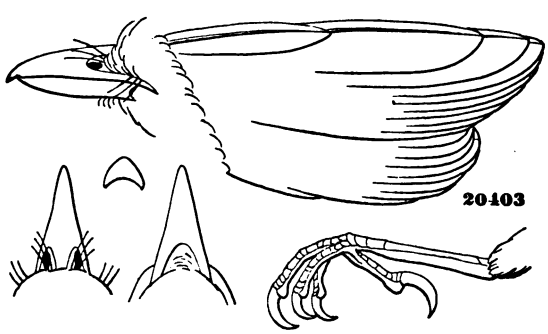
(447.) Type.

Vireolanius pulchellus.

Vireolanius pulchellus, SCLATER & SALVIN, Ibis, 1859, 12 (Guatemala).—LAWRENCE, Ann. N. Y. Lyc. VII, 1862 (Panama).—SCLATER, Catal. 1861, 45, no. 273.

Hab. Mexico and Guatemala, to Panama Isthmus.

(No. 20,403, Choctun.) Upper part of head from bill and nape blue; rest of upper parts and sides of whole head (to nostrils) and neck deep dark green. Beneath light yellowish-green, more yellow on the belly and crissum; throat almost pure yellow, as are the inner wing coverts and inner edges of the quills, the lat-



Vireolanius pulchellus, SCL. & SALV. (Vera Paz)

ter with more of a buff tinge. Bill and legs dark plumbeous, the former whitish along the tomia.

Total length, 5.50; wing, 2.85; tail, 2.40; exposed portion of 1st primary, 1.00, of 2d, 1.80, of longest (4th) (measured from exposed base of 1st primary), 2.10; length of bill from forehead, .74, from nostril, .44, along gape, .81, depth, .28; tarsus, .82; middle toe and claw, .69, claw alone, .25; hind toe and claw, .54, claw alone, .27.

In some specimens there is an extremely obsolete indication of a yellowish spot on lower eyelid, and a yellowish infra-ocular line from commissure. The supra-ocular green of side of head is also sometimes rather paler than the post-ocular portion, in slight contrast, and all the green of the side of the head is lighter than that of the back. Sometimes the blue of the head is more or less mixed with green. The lores are green like the rest of the side of head.

This species differs from the type in having the tail shorter, instead of a little longer than the wings.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
22,373	43,557	♂	Mexico.	...	Verreaux.	.....
28,040	64	..	Mirador, Mex.	...	Dr. Sartorius.	.....
20,403	1,580	..	Choctum, Vera Paz.	Jan. 1860.	O. Salvin.	.....
..	177	..	Guatemala.	...	Cab. Lawrence.	.....
29,430	..	..	"	...	Capt. J. M. Dow.	.....
34,665	..	♂	Angostura, C. R.	June 11, '64.	J. Carmiol.	.....

Vireolanius eximius.

Vireolanius eximius, BAIRD.

Vireolanius icterophrys, SCLATER, P. Z. S. 1855, 161, pl. 103 (Bogota), not of BONAPARTE.

Hab. Bogota.

Coloration precisely similar to that of *V. pulchellus*, but with a bright yellow stripe from nostrils above and beyond the eye, a yellow infra-ocular spot, and dusky lores. Bill and legs blackish; the lower mandible whitish at end.

Total length, 5.50; wing, 3.00; tail, 2.50: length of bill from forehead, .80, from nostril, .50, along gape, .85, depth, .32; tarsus, .80.

As in *V. pulchellus*, the top of head is clear blue; the rest of upper parts, and the sides of head, dark green; the under parts light yellowish-green; the chin and throat, and inside of wings, clearer yellow, as also the inner edges of the quills. The bill is longer than in *V. pulchellus*.

The species is described from a specimen in the museum of the Philadelphia Academy.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
..	..	..	Bogota.	"	Cab. Phila. Acad.	Type.

Vireolanius icterophrys.

Vireolanius icterophrys, Bon. Comptes Rendus, XXXVIII, 1854, 380 ("Rio Negro").—Ib. Notes Delattre, 60.

Hab. "Cayenne;" "Rio Negro;" Eastern Peru.

(Sp. Phila. Acad.) Top of head and nape plumbeous; rest of upper parts deep green. Under parts, inner face of wings, and inner edges of quills bright clear yellow, rather paler behind, and more olive on flanks. A broad band from nostrils over and beyond the eye, and spot on lower eyelid (coming to the edge), yellow. Lores, continuous with a line through and behind the eye, and a line from side of lower jaw beneath and beyond the eye, blackish-plumbeous, passing behind into plumbeous like the nape, the space between them and behind the eye white. Bill and feet blackish.

Total length, 5.00; wing, 2.85; length of bill from forehead, .73, from nostril, .40, along gape, .82, depth, .28; tarsus, .77.

The yellow superciliary line is broadest anteriorly, but does not cross the base of the culmen; its posterior feathers are whitish. The post-ocular plumbeous stripe passes into the plumbeous nape. The lower dark stripe is bordered behind by the downward extension of the white infra-ocular band; anteriorly it does not quite reach the lower mandible, on account of the upward extension of the yellow of chin.

The specimen of this species in the museum of the Philadelphia Academy is labelled as from Cayenne. Bonaparte quotes his as from the Rio Negro.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
39,819	..	..	Head of Huallaga,	...	W. S. Church.	Very defective.
..	1,163	♂	Cayenne. [R. Peru.	...	Mus. Phila. Acad.	.....

Vireolanius chlorogaster.

Vireolanius chlorogaster, Bon. Comptes Rendus, XXXVIII, 1854, 380 ("S. America").—Ib. Notes Orn. Delattre, 60.—Sclater, Catal. 1861, 45, no. 272*a* (Eastern Peru).

Hab. Eastern Peru.

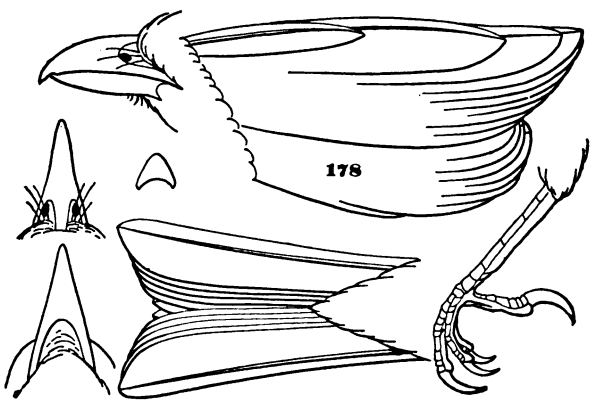
Top and sides of head and nape plumbeous; rest of upper parts green.

Cyclorhis g. SCLATER, P. Z. S. 1858, 448 (Cayenne, etc.).—IB. Catal. 1861, 45, no. 274.

Cyclorhis poliocephala, TSCHUDI, Wieg. Arch. 1845, 363 (N. Brazil and Guiana).—(? Not of Fauna Peruana, 169).

Hab. Guiana (and eastern Brazil ?).

(No. 178, ♂, Cab. G. N. Lawrence, Cayenne.) Head (including cheeks and chin) and nape clear pure light plumbeous, the chin considerably paler. Rest



Cyclorhis guianensis, SCLATER. (Cayenne.)

of upper parts unvaried olive green, continuous with a rather narrow band across the lower part of the throat and extending on side of breast, which are of more yellowish olive. Inside of wings, axillars, and inner edges of quills yellow. Remaining under parts grayish, the median line and lower belly white. Longer crissal feathers tinged with olive. A broad orange brown stripe from nostrils (where it meets its fellow and forms a frontal band) over and beyond the eye to the nape, the eye placed a little anterior to the middle of the band. Bill horn color; the lower mandible, except at tip, blackish-plumbeous. Legs dusky.

Exposed portion of 1st quill more than half that of the 2d, which is rather shorter than secondaries; 4th and 5th quills longest.

The band across the lower throat scarcely involves the jugulum, and is a little more than half an inch wide. The flanks and tibiæ are grayish, without any wash of olive. The under surface of tail is decidedly olive green.

(No. 178.) Total length, 5.25; wing, 2.75; tail, 2.50; exposed portion of 1st primary, 1.00, of 2d, 1.70, of longest (4th) (measured from exposed base of 1st primary), 2.05; length of bill from forehead, .71, from nostril, .45, along gape, .80; depth, .32; tarsus, .83; middle toe and claw, .64, claw alone, .26; hind toe and claw, .56, claw alone, .30.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	178	♂	Cayenne.	...	Cab. Lawrence.	.....

A. Gape of mouth much arched. Metatarsal scutellæ in two series. Body streaked beneath.

Dulinæ. Legs very stout, though short. Nostrils large, circular, exposed, with naked membrane behind though scarcely above them. Frontal feathers directed backwards, soft, and like those of rest of head; with few bristles. Wings longer than the narrow, nearly even tail. First primary nearly one-half the 2d, which is much longer than secondaries. Under tail coverts reaching over about the basal two-fifths of tail. Adults streaked longitudinally beneath. Young unknown.

B. Gape of mouth nearly straight. Metatarsal scutellæ in three series. Body plain beneath.

Ampelinæ. Legs moderate. Nostrils elongated, linear, with the frontal feathers extending close to the edge and to anterior extremity, concealing them; these feathers short, velvety, and erect, with few bristles. Wings very long and acute; outer or 1st primary so much reduced as to be almost inappreciable; the 2d nearly the longest. Wing nearly twice the length of the short, narrow, even tail. Under coverts of tail reaching almost to its tip. Secondary quills with flat horny appendages at end of shaft like red sealing wax. Young birds streaked beneath as in *Dulus*. Adults plain.

Ptilogonatinæ. Legs moderate. Nostrils oval, with wide naked membrane above, and to some extent behind them; the frontal feathers not reaching to their border, and rather soft. Wings graduated, shorter than the somewhat broad, fan-shaped tail; the 1st quill nearly half the 2d. Young birds without spots or streaks; adults plain.

Subfamily DULINÆ.

DULUS, Vieillot.

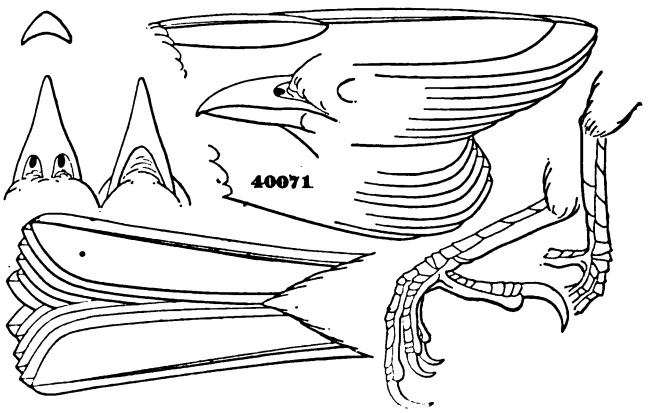
Dulus, Vieillot, Analyse, 1816, 42, no. 131. (Type "*Tangara esclave*," Buffon = *Tanagra dominica*, Linn.)

Plumage compact. Wings moderately pointed, a little longer than the nearly even, slightly rounded tail. First quill not quite half the 2d, which about equals 6th; 3d and 4th longest. Tail feathers rather narrow.

Bill shaped much like *Icteria;* considerably decurved; culmen decurving from base, upper edge of lower mandible less so; commissure much arched; mouth deeply cleft. Bill broad as well as high at base, compressed about the middle to the strongly notched tip; lower bill with slight broad notch. Tongue rather narrow, horny towards tip, and simply bifid. Nostrils large, circular, in anterior end of nasal groove; surrounded, except anteriorly, by membrane; the frontal feathers not directed forwards, and with few bristles, not reaching to posterior edge of nostrils. Rictal bristles short.

Legs very stout; tarsus scarcely as long as middle toe and claw: about seven well-marked scutellæ anteriorly; sides of tarsus normally of a single plate

each, a little subdivided below; in No. 40,071 divided on outer side into two plates in right leg, not divided in left. Lateral toes nearly equal; the outer



Dulus dominicus, STRICKL. (Hayti.)

claw reaching to base of middle claw. The basal joints of claws short; the basal joint of middle claw adherent for two-thirds its length to basal joint of outer, and for same distance to about half basal joint of inner; the adhesion less than in *Vireo*.

In the preceding description I have combined the characters of the genus and the subfamily, as *Dulus* is thus far the only known member of the *Dulinæ*. The form is a very peculiar one, and its precise systematic position is a matter of much uncertainty. It has been placed by Dr. Sclater among the *Vireonidæ;* but from them it differs in the longer basal phalanx of middle toe; less amount of adhesion of the anterior toes; shorter tarsi; much broader and more deeply cleft gape; less extension forward, more backward direction, and softer texture of frontal feathers (the tips of which do not run into bristles); fewer bristles about the mouth; the broader and more exposed nostrils, etc. The tip of outer claw reaches only to base of middle claw, instead of nearly to the middle as in *Vireonidæ*. The genus was assigned by H. E. Strickland to the *Ampelidæ*, and the majority of its characters seem to indicate a place intermediate in some respects between *Ampelis* and *Ptilogonys*, and I there leave it for the present. The longitudinal streaks of the under parts, although more conspicuous, are somewhat like those of the young *A. cedrorum*, and strengthens the propriety of associating the two. None of the true *Vireonidæ*, either as adults or young, as far as known, are at all streaked or spotted.

Dulus dominicus.

Tanagra dominica, LINN. Syst. Nat. I, 1766, 316 (based on *Tangara dominicensis*, BRISSON, III, 37, tab. 2, fig. 4, St. Domingo).—GM. I, 1788, 894.—*Dulus dominicus*, STRICKL. Cont. Orn. 1851, 103 (rectification).—LAFR. Rev. Mag. 1851, 583 (habits, affinities, etc.).—SCLATER, Catal. 1861, 41.

Dulus palmarum, VIEILL. Nouv. Dict. X, 1817, 438.—IB. Encycl. Méth.

(No. 40,071.) Feet extremely stout; tarsus shorter than middle toe and claw. Wings longer than nearly even tail, moderately pointed; 1st quill nearly half the 2d, which about equals 7th; 4th longest; 3d and 5th scarcely shorter.

Above olive brown, becoming olive green on the rump and edges of quill- and tail feathers; darker olive on the head, the sides of which are fuscous brown. Beneath whitish; all the feathers with central linear streaks of olive brown, narrowest on belly, broadest on crissum (which is tinged with olivaceous). Inner lining of wings pale fulvous; inner edges of quills whitish. Bill pale horn color, lighter below; feet rather dusky.

(No. 40,071.) Total length, 6.25; wing, 3.20; tail, 2.75, nearly even; exposed portion of 1st primary, .95, of 2d, 2.15, of longest (measured from exposed base of 1st primary), 2.30; length of bill from forehead, .61, from nostril, .36, along gape, .80, depth, .24; tarsus, .80; middle toe and claw, .84, claw alone, .25; hind toe and claw, .65, claw alone, .31.

A specimen in the Philadelphia Academy, although marked female, is considerably larger, though apparently not otherwise different. That described above was kindly supplied by Prof. Agassiz.

According to Strickland (Cont. Orn. 1851, 104), *Dulus nuchalis*, of Swainson ($2\frac{1}{4}$ Centen. 1838, 345), forms a second species, closely allied, but with a transverse bar of white on nape. The type (from Brazil) is said by him to be in the Cambridge Museum.

NOTE.—Since writing the preceding article several specimens have been received from Mr. A. E. Younglove.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
40,071	..	..	Jeremie, Hayti.	1864–5.	Mus. Comp. Zool.	P. R. Uhler.
41,856	6	♂	" [Hayti.	Jan. 29, '66.	A. E. Younglove.	.....
41,855	6	♂	Port au Prince,	April 10, '66	"	.....
..	477	♀	St. Domingo.	...	Cab. Phila. Acad.	.....

(40,071.) Alcoholic sp. (41,855.) Bill and eyes black. (41,856.) Bill and eyes black.

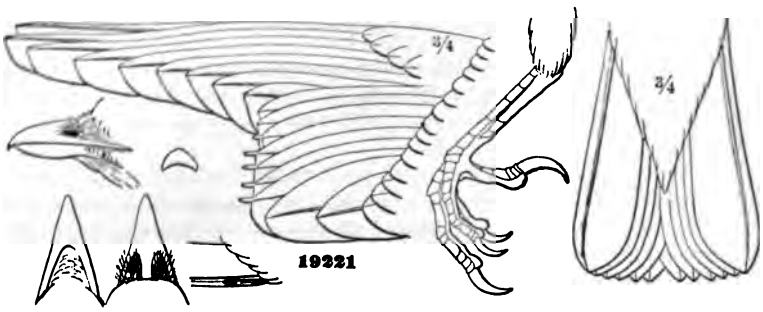
SUBFAMILY AMPELINÆ.

AMPELIS, LINN.

Ampelis, LINN. Syst. Nat. 12th ed. I, 1766, 297. (Type *Lanius garrulus*, L. Named by Linnæus in 1735.)

Bombycilla, VIEILLOT, Ois. Am. Sept. I, 1807, 88. (Type *B. cedrorum*.)
"*Bombyciphora*, MEYER, 1810" (Gray). — "*Bombycivora*, TEMM. 1815" (Gray).

Body stout, compact; plumage silky and soft. Wings long and much pointed, considerably longer than the narrow, nearly even tail. An extremely



Ampelis garrula, LINN.

small first primary, which sometimes is visible on the inner side of the base of the second quill, sometimes rests on the outer side as in other Oscines supposed to have only nine primaries (see pages 160, 325). The 2d quill is nearly as long as the 3d; the remaining primaries graduate very rapidly to the 10th, which reaches scarcely beyond half the exposed portion of 3d. The shafts of the secondaries are tipped by a flattened, obovate horny appendage of a bright red color, like sealing wax; traces of something similar to which may sometimes be seen on the tail. The tail is narrow and nearly even.

Bill short, deeply cleft, depressed, and broad at the base, the width of mouth more than two-thirds the commissure; the culmen and gonys considerably less than half the gape, and both much curved from base, the commissure nearly straight. The tip of upper mandible is decurved, deeply notched, and with a decided tooth behind the notch; lower bill slightly notched. The nasal fossæ are filled with soft, short, erect, velvety feathers, advancing far forward close along the upper edge of nostrils, and concealing them; the nostrils are much elongated, and narrowly elliptical. The rictal bristles appear to be wanting, although a few short ones overhang the base of the bill.

The tongue is broad, fleshy, sagittate behind, horny and bifid at the tip. The legs are short, but stout; the tarsus scarcely longer than the middle toe without claw: decidedly shorter than the entire toe; distinctly scutellate: five or six divisions anteriorly; the lateral plates on both sides also more or less subdivided in *Ampelis garrula*, especially inferiorly. The lateral toes are slightly unequal, the claws of the outer or longer barely reaching the base of middle claw. The basal joint of middle toe is adherent for one-half to one-third the adjacent joint of the inner toe, and for a little more than that distance to barely more than one joint of the outer, the basal joint of middle and inner toes being of about equal length; the scutellæ above basal joints of anterior toes in three series. The hind toe is about equal to the inner lateral.

In *A. garrula* the naked skin on the posterior edge of tarsus between the two lateral plates, and on inner side between the lateral and frontal, shows a development of small hexagonal plates—seen to much less extent in *A. cedrorum*, where also the lateral tarsal plates are frequently undivided, except at lower end.

The young of *A. cedrorum* are streaked longitudinally beneath, as in adult *Dulus*, although more faintly.

The genus *Ampelis* exhibits a close resemblance to *Progne* in the broad, deeply cleft bill; the long, pointed wings; the short, stout legs. The most striking differences in *Progne* consist in the still broader and more deeply cleft bill, less hooked lower mandible, open superior and rounded nostrils, absence of spurious first primary, etc., with others of less signification. Still it would not be at all surprising to see them associated more closely by authors than has hitherto been the case.

Three species of the genus *Ampelis* are known: one common to the northern portions of the northern hemisphere, one peculiar to North America, and a third found in Japan and Eastern Siberia. They may be distinguished by the following diagnosis:—

A. Terminal band of tail yellow.
  Yellowish cinnamon; more plumbeous behind. Chin, forehead, and band from forehead above and behind the eye, black. A white mandibular patch.
    Large; chin and throat black; crissum orange brown; two white bands on the wing, and a white line along tips of primaries . . . . *garrula.*
    Smaller; chin only black; crissum whitish. No white on wing . . . . . *cedrorum.*

B. Terminal band of tail red.
  Colors generally similar to those of *A. cedrorum*. A red band across the end of the greater wing coverts. Black line behind eye continued along under side of crest, which is very long *phœnicopterum.*

The *A. phenicopterum* is stated by Temminck to have the nasal setæ so short as to leave the nostrils exposed, and to lack the sealing-wax appendages; the latter condition may, however, result from the immaturity of the specimen, as it is very common to find the same thing in individuals of the other species.

Ampelis garrula.

Lanius garrulus, Linn. "Fauna Suecica, 2, no. 82."—Ib. Syst. Nat. 10th ed. 1758, 95.—*Ampelis garrulus*, Linn. Syst. Nat. 12th ed. 1766, 297 (Europe).—Bon. Consp. 1850, 336.—Baird, Birds N. Am. 1858,

317.—Boardman, Pr. Bost. Soc. Nat. Hist. IX, 1862, 126 (Calais, Me.)—Cooper, Pr. Cal. Acad. II, 1861 (1863), 122 (Fort Mohave, Ar.).—*Bombycilla garrula*, Bon. Zool. Jour. III, 1827, 50.—Ib. Synopsis, 1828, 438.—Ib. Am. Orn. III, 1828, pl. xvi.—Rich. F. B. A. II, 1831, 237.—Aud. Orn. Biog. IV, 462, pl. 363.—Ib. Birds Am. IV, 169, pl. 246.—Max. Cab. Jour. VI, 1858, 188. (American.)—*Bombycilla garrula*, Keys. & Blas. Wirb. Europas, 1840, 167.—Degland, Ornith. Europ. I, 1849, 349 (European.)—Wolley, Pr. Z. S. 1857, 55 (nest and eggs).—Newton, Ibis, 1861, 92, pl. iv (nesting).—Nordmann, Cab. Jour. VI, 1858, 307, and VII, 1859, pl. i (nesting). (European.)

Hab. Northern parts of Europe, America, and Asia. In America not hitherto found in the western province. In winter extending along the Rocky Mountains and the plains as far south as Fort Massachusetts and Fort Riley; regular visitor to shores of Lake Michigan and Lake Erie. East of this rarely seen along the United States border.

For the description and general remarks relative to this species I refer to the Birds N. Am. quoted above. According to Degland, the female differs in less extent of black of throat, the quills having the white or yellow confined to the ends of outer webs only, instead of on the inner webs also, and a less number and smaller size of the cartilaginous appendages.

The specimen seen by Dr. Cooper, at Fort Mohave, if really of this species, fixes the most western locality on record.

For many years authentic eggs of the Bohemian Chatterer were greatly sought after, but it was not until 1856 that any were brought to the notice of the scientific world, when the late Mr. H. Wolley discovered them in Lapland. Early duplicates from his collection were sold at five guineas each, and although a good many have since been obtained, they are yet considered as great prizes. A nest, with its eggs, of those collected by Mr. Wolley, has been presented to the Institution by Mr. Alfred Newton. The only instances on record of their discovery in America are of a nest and one egg by Mr. Kennicott, on the Yukon, in 1861, and a nest and single egg on the Anderson River, by Mr. MacFarlane, both of which, with the female parents, are in the possession of the Institution.

—Ib. Catal. 1861, 45, no. 276.—? Sclater & Salvin, Ibis, I, 1859, 13 (Guatemala).—*Cyclorhis fl.* Tschudi, Archiv Naturg. 1845, 363 (Mexico).

Hab. Southern Mexico and Guatemala.

(No. 37,498, ♂.) Upper part and sides of head, with nape, ashy, with a broad stripe of rufous brown from each nostril (the two confluent anteriorly) over and beyond eye to nape (the eye considerably anterior to the middle of the stripe); rest of upper parts olive green. Chin very pale ashy; rest of inferior surface, with inside of wings, bright yellow. Upper mandible pale; lower, plumbeous black, the end whitish. Legs apparently flesh color. "Iris cherry red." Second quill shorter than the 10th; 3d less than the 7th.

(No. 37,498, ♂.) Total length, 6.10; wing, 3.25; tail, 2.95; exposed portion of 1st primary, 1.25, of 2d, 2.00, of longest (5th) (measured from exposed base of 1st primary), 2.55; length of bill from forehead, .85, from nostril, .50, along gape, .85, depth, .37; tarsus, .92; middle toe and claw, .75, claw alone, .30; hind toe and claw, .68, claw alone, .34.

In the specimen described, and in fact in all before me, there is a faint wash of ochraceous on the vertex, though in several, as No. 30,874, the color of the ash is nearly pure. In this same specimen the ochrey color of the forehead extends over the lores, and involves the lower eyelids to a greater degree than usual. The ash of the chin is much restricted—being limited to the space between the rami.

There is not much variation in the extensive series before me. The yellow is sometimes deeper in spring specimens; in autumnal it is paler, with a slight buffy tint. It is somewhat remarkable, however, that of four Guatemalan skins in the collection, three should lack the black of the lower jaw. The fourth, from Coban, a locality nearest of all to Mexico and Yucatan, is as described above. I can detect no other difference. All other specimens have the dark spot in question.

The uniform yellow of the under parts sufficiently distinguishes this species from all its allies.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
37,498	58	♂	Orizaba, Mex.	Jan. 28, '65.	Prof. Sumichrast.	.....
37,499	21	..	"	Jan. 6, '65.	"	.....
38,162	91	..	"	...	M. Botteri.	.....
30,874	120	..	Mirador, Mex.	Mar. 1863.	Dr. Sartorius.	.....
30,873	120	..	"	"	"	.....
37,915	192	♀	Merida, Yuc.	Feb. 19, '65.	Gov. Salazar.	Dr. Schott.
37,916	191	♀	"	"	"	"
37,917	193	♀	"	"	"	"
39,279	495	♂	"	May 23, '65.	"	"
22,372	32,615	..	Coban.	...	Verreaux.	.....
39,169	..	..	Guatemala.	...	J. Gould.	.....
..	180	♂	"	...	Cab. Lawrence.	.....

(37,499.) Iris brown; bill and feet flesh color. (30,874.) Eyes cherry red. (30,873.) Do.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
33,011	..	♀	Sherborn, Mass.	...	A. L. Babcock.	.....
1,617	..	♂	Carlisle, Pa.	July 4, '44.	S. F. Baird.	.....
20,642	645	♂ ♀	Moose Factory.	Aug. 26, '60.	C. Drexler.	.....
18,508	..	♀	Red River Settlem't.	...	D Gunn.	.....
27,034	..	..	"	...	Gov. Mactavish.	.....
28,920	586	♀	Washington.	Mar. 2, '60.	Elliot Coues.	.....
32,270	..	..	Macon, Ga.	April, 1848.	Prof. Jos. Leconte.	.....
33,878	..	..	Tortugas.	...	Capt. Woodbury.	.....
5,318	..	..	Yellowstone River.	July 24, '56.	Lt Warren.	Dr. Hayden.
38,413	..	..	Laramie Riv. [W.T.	May, 1864.	Dr Hitz.	.....
15,957	367	♂	Chiloweyuck Depot	July 6, '59.	A. Campbell.	Dr. Kennerly.
21,939	489	..	Sinyakwateen "	July 3, '60.	"	"
4,236	..	..	San Francisco.	1853–1854.	R. D. Cutts.	.....
26,591	..	♂	Cape St. Lucas.	1859.	J. Xantus.	.....
3,958	..	♀	Tamaulipas, Mex.	Mar. 20, '58.	Lt. Couch.	.....
20,405	1,862	..	Choctun, Vera Paz.	Jan. 1860.	O. Salvin.	.....
7,952	..	..	Guatemala.	...	J. Gould.	.....

Subfamily PTILOGONATINÆ.

The characters of the subfamily have already been stated on page 401, but it still remains to discuss the question of its precise extent. As generally given by authors, it includes two series of genera, the most apparent external distinction between them consisting in the distinct scutellæ on the anterior face of the tarsus in the one, which are wanting in the other. These more palpable features are, however, accompanied by others, of more or less importance, and I can hardly avoid the conclusion that they should belong to different families, one, embracing *Ptilogonys* and *Phænopepla* (*Ptilogonatinæ*), remaining with the *Ampelidæ;* the other (*Myiadestes, Cichlopis, Platycichla*) removed as *Myiadestinæ* to near the *Turdidæ* and *Saxicolidæ.*

The following diagnostic characters will serve to illustrate the features of these two groups as compared with each other:—

Ptilogonatinæ. Tarsus stout, shorter, or not longer than middle toe and claw; conspicuously scutellate anteriorly, and frequently on one or other or on both sides; sometimes with a row of small plates behind. Wings much graduated; the second quill not longer than secondaries. Outline of lateral tail feathers parallel or widening from base to near tip. Tail unvaried, or else inornate at end. Quills without light patch at base. Head crested. Young birds not spotted. Not conspicuous for song.

Myiadestinæ. Tarsus slender, longer than middle toe and claw; undivided as in *Turdidæ*. Toes deeply cleft. Wings more pointed; second quill much longer than secondaries. Lateral tail feathers cuneate, or narrowing from base towards tip; generally whitish at end on inner web. Quills with their extreme bases, especially of inner webs, buffy yellow, showing a light patch inside. Head not crested, though the feathers sometimes full. In the young all the feathers with light rounded spots. Pre-eminent as melodious singers.

It may be considered that the presence or absence of scutellæ on the tarsus is a matter of comparatively slight importance, since in some Thrushes having normally smooth tarsi, we occasionally find individual specimens exhibiting scutellæ, and the Mocking Birds differ from the true Thrushes in having such scutellæ. Yet when to this we add the tendency in *Ptilogonys* and *Phænopepla* to division of the whole length of the lateral plates, and even occasional indications of a supplementary series on the posterior edge of tarsus, the difference from the smooth tarsi of *Myiadestes* and its allies, is one of essential moment. Add to this the peculiarities of marking in young birds, and the difference of vocal powers, and the grounds for separation would seem well established, and the assignment of the *Myiadestinæ*, as a subfamily, to a place near the *Saxicolidæ* and *Turdidæ* (perhaps better under the latter), well founded, as all the characters referred to above apply to the *Turdinæ*. Since, however, other authors may not agree with me in this view, and as the *Turdidæ* have already been discussed, I propose to present the *Myiadestinæ* in the present article after the *Ptilogonatinæ*, and to leave the final decision of their true position to a future period.

The comparative diagnoses of *Myiadestinæ* and *Turdinæ* may be expressed as follows :—

Common Characters.—Tarsi without regular transverse scutellæ, except at lower end. Wings acute, pointed, as long as or longer than tail, which is but slightly graduated. First primary rarely half 2d, which exceeds the secondaries. Base of quills buffy yellow, as are inner edges. Tail spotted or varied at the end. Young birds with many light spots. Very melodious singers.

Myiadestinæ. Bill short, much depressed; mouth deeply cleft; width at base about equal to the distance from nostril to tip, or greater; commissure more than twice distance from nostrils to tip of bill, and nearly two and a half times length of gonys. Legs weak; tarsi rather longer than middle toe and claw. Tail feathers tapering slightly from base to near tip, giving a slightly cuneate appearance to the tail.

Turdinæ. Bill stouter, more lengthened; narrow at base and more compressed; width at base less than distance from nostril to tip; commissure not more than twice distance from nostrils to tip of bill, and about twice length of gonys. Tarsi stouter, longer than middle toe and claw. Tail feathers widening slightly from base to near tip, giving a parallel sided or slightly fan-shaped appearance to the tail.

The *Miminæ* differ from both in the strongly scutellate tarsi; shorter, more rounded wings, the 1st primary generally half the 2d; the tail usually much graduated, etc.

It still remains to be determined whether there is any essential family difference between the typical *Turdidæ* and the *Saxicolidæ*, and whether a rearrangement of these groups, perhaps including even the *Sylviidæ*, may not be required. In any case, however, that the *Myiadestinæ* must be embraced in the same series, I have little question.

The two genera of *Ptilogonatinæ*, as restricted, with the common characters given above, differ as follows:—

Phænopepla. Crest narrow, pointed behind. Outer primaries broad, not attenuated nor pointed at end; the 1st half the 2d. Tail rounded, fan-shaped; feathers very broad, wider towards end. Bill feeble, rather narrow, well bristled; nostrils somewhat overhung by frontal feathers. Sexes dissimilar; male black; quills with median white patch on inner webs; tail not varied.

Ptilogonys. Crest broad, and decumbent. Outer primaries narrow, attenuated and pointed at ends; 1st about one-third the 2d. Tail even or cuneate, feathers narrower. Bill stouter, much broader, fewer rictal bristles; nostrils much exposed. Sexes similar; color cinereous; wings not varied; tail feathers with median white patch on inner webs.

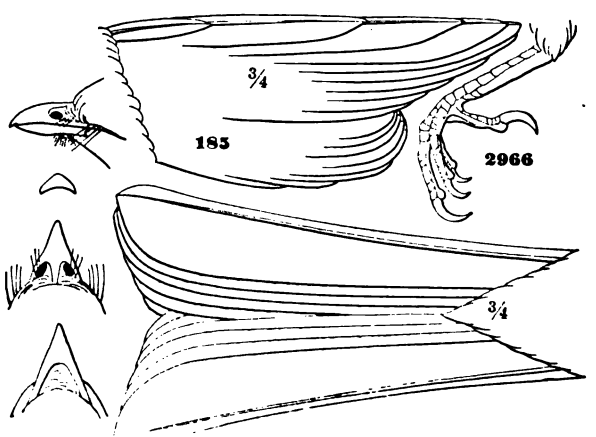
PTILOGONYS, SWAINSON.

Ptilogonys, SWAINSON, Catal. Bullock's Mex. Mus. 1824. (Type *P. cinereus.*)

Ptiliogonys, SWAINSON, Philos. Mag. I, May, 1827, 368. (Same type.)

Ptiliogonatus, SWAINSON, Zool. Jour. III, July, 1827, 164. (Same type.)

Plumage soft, silky, glossy, and rather compact. Head with a broad, full, soft crest, not pointed behind. Tibiæ thickly tufted with full, soft feathers.



Ptilogonys cinereus, SWAINSON. (Mexico.)

Tail longer than wings, somewhat fan-shaped, nearly even in type, the slight emargination greater than the rounding (in *caudatus* much graduated, with central feathers prolonged). Feathers broad, the outer webs very narrow. Wings pointed, although the outer feathers are much graduated; 1st quill not half the 2d, which is shorter, the 3d rather longer, than secondaries; 5th and 6th longest; 1st, 2d, and 3d attenuated and acuminate at end.

Bill short, much depressed, hooked and notched at both tips; gape wide and deep; commissure straight; culmen for terminal half and short gonys considerably curved. Nostrils oval, bordered above and behind by membrane, the frontal feathers reaching not quite to the posterior margin; rictal bristles distinct, but moderate.

Legs weak; tarsi very short, less than middle toe and claw, with strongly marked rough scutellæ (seven) anteriorly, one or two divisions on the lower part of sides. Outer toe rather longer than inner, and reaching just beyond base of middle claw. Hind claw considerably longer than middle. Basal joint of middle toe adherent for almost its whole length to one and a half joints of outer; internally for basal half of length to basal half of first joint of inner.

P. caudatus, very similar otherwise, differs remarkably in structure of tail, which is cuneate and nearly one and a half times the length of the wing; the two central feathers greatly prolonged and tapering gently to a rounded narrow tip, the other feathers graduate from these to the outermost.

Ptilogonys differs from *Myiadestes* in more compact plumage; a shorter, broader, thicker bill; the frontal feathers much less bristly; the nostrils broader and more exposed, with a greater extent of naked membrane behind them. The legs are shorter, but stouter; tarsus much shorter and roughly scutellate, not smooth; the claws thicker and more curved; the hinder considerably larger than the middle. Nearly the whole extent of basal joint of middle toe is adherent externally, not the half only; internally adherent for half to the basal half of first joint of inner, which in *Myiadestes* are divided to base. The wing is much more graduated; the third quill having the relationship to the longer ones that the second has in *Myiadestes*. The tail lacks the deep emargination of *Myiadestes;* the lateral feathers are of equal width to near the end, or even wider, instead of becoming narrower.

There has been much diversity among writers in the spelling of the name of this genus, Mr. Swainson, its author, having himself written it very differently. His first rendering of the name, however—*Ptilogonys*—is more nearly correct than the subsequent ones, as compounded of πτιλον and γονυ, or feathered knee, in allusion to the tuft of cottony feathers on the tibiæ.

The two known species of *Ptilogonys* are quite similar in coloration, but differ markedly in shape of tail, which in one is even, in the other greatly cuneate. The characters are as follows:—

COMMON CHARACTERS. — General color bluish-ash. Wings and tail glossy greenish-black. Quills edged internally with white. A broad, large white patch on inner webs of tail feathers. Crissum egg yellow; flanks more olivaceous. Tibiæ cottony white.

A. *Ptilogonys.* Tail a little longer than wings; nearly even.
Head ashy. Cheeks and nape (concealed partly by incumbent crest) smoky ash; forehead and chin whitish, the latter passing into ash of throat and breast. Eye-ring white. White tail patches rectangular . . . . . *cinereus.*

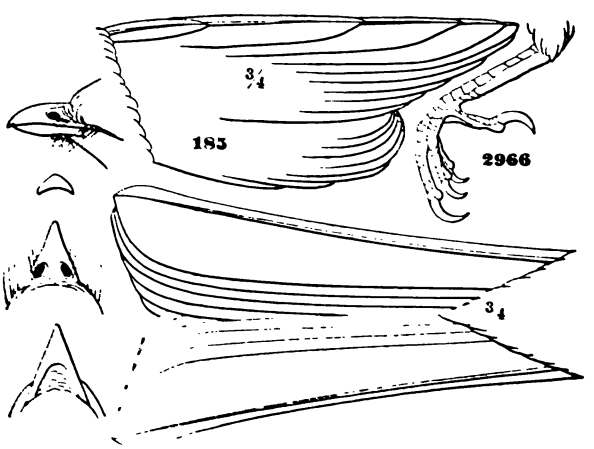
B. *Sphenotelus.* Tail almost one and a half times wings; pointed and very cuneate.
Head and nape all round olivaceous-yellow; top of head ashy. Eye-ring yellow. White tail patches lozenge-shaped . . . . . *caudatus.*

Ptilogonys cinereus.

"*Ptilogonys cinereus*, SWAINSON, Catal. Bullock's Mex. Mus. 1824, app. p. 4."—BON. Consp. 1850, 335.—CABANIS, Mus. Hein. 1851, 55.—BAIRD, Birds N. Am. 1858, 319.—SCLATER & SALVIN, Ibis, 1859, 13; 1860, 31 (Guatemala).—SCLATER, P. Z. S. 1856, 299 (Cordova); 1858, 302 (Oaxaca); 1859, 364 (Jalapa), 379 (Oaxaca; eggs); 1864, 173 (City of Mexico).—IB. Catal. 1861, 47, no. 284.—*Ptiliogonys cinereus*, SWAINSON, Phil. Mag. I, May, 1827, 368; Zool. Ill. Ser. 2, pl. 62, 120.—*Ptiliogonatus cinereus*, SWAINSON, Zool. Jour. III, July, 1827, 164.

Hypothymis chrysorrhoa, TEMM. Pl. Col. pl. 452.

Hab. Mountain regions of Mexico, from near northern border: south to Guatemala.



Ptilogonys cinereus, SWAINSON. (Mexico.)

(No. 30,719.) Plumage compact; rather silky. Wing considerably shorter than the tail, which is almost even, slightly emarginated, broad and somewhat fan-shaped, the feathers widening from base to near tip; the central only with parallel edges to the rounded tip, and rather shorter than the lateral. First quill much less than half the 2d, contained about three times and a half in the longest (5th), falcate and rather acute; the 2d equal to 10th; the 3d about equal to 7th; the ends of the 2d and 3d quills attenuated and acute. Tarsi distinctly scutellate; rictal bristles moderate.

Predominant color dark bluish-ash, scarcely lighter below; the head all round pale ash; the forehead, chin, and side of lower jaw almost white; the cheeks and the nape (mostly concealed by the incumbent crest) smoky ash; eyelids white; lores and space below eye blackish. Quill- and tail-feathers glossy greenish-black, varied above only by a narrow border of the back-color, the quills abruptly edged internally with white, the axillars varied with the same, the tail feathers having the middle third of their inner webs white, in a rectangular patch. Anal region behind, and crissum rich Indian or egg yellow; the flanks posteriorly olive yellow. Tibiæ and middle of belly white. Bill and legs black. "Iris carmine" (*Xantus*).

(No. 30,719.) Total length, 8.00; wing, 3.75; tail, 4.30; width of outer feather, .50; difference between 10th and longest quills, .80; exposed portion of first primary, .78, of 2d, 1.90, of longest (6th) (measured from exposed base of 1st primary), 2.90; length of bill from forehead, .55, from nostril, .28, along gape, .73; tarsus, .60; middle toe and claw, .65, claw alone, .20; hind toe and claw, .45, claw alone, .22.

Immature birds, perhaps females, differ in having the ashy tints of the body replaced by dirty brownish, of an umber or sepia tint, and traces of the same are not unfrequently seen in the more perfectly plumaged specimens. Indistinct, scarcely appreciable spots of olive green are sometimes to be seen in the feathers of the back.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
30,139	510	♂	Sierra Madre, near	April, 1863.	John Xantus.	Length, 7.75; iris
2,966	..	..	Mexico. [Colima.	...	S. F. Baird.	.. [carmine.
38,155	167	Juv.	Orizaba.	...	M. Botteri.	.....
38,156	167	Juv.	"	...	"	.....
30,719	377	♀..	Dueñas, Guat.	1861.	O. Salvin.	.....
30,720	4,353	..	"	Nov.	"	.....
....	183	♂	Cordova.	...	Cab. Lawrence.	.....

Ptilogonys caudatus.

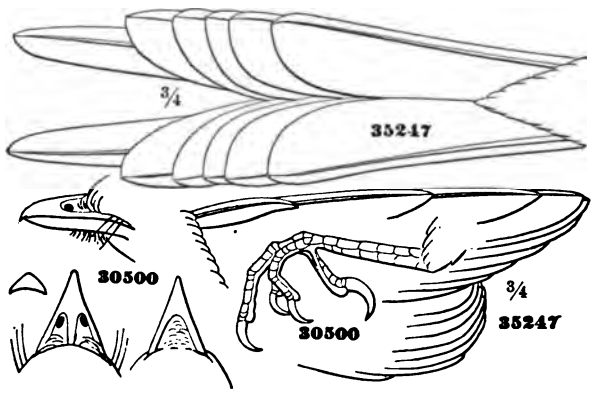
Ptilogonys caudatus, CABANIS, Jour. 1860 (May, 1861), 402 (Costa Rica).

Hab. Mountains of Costa Rica.

(No. 35,247.) Tail much graduated; the central feathers prolonged, and tapering gently from the middle to a rounded point; the others successively shorter; the lateral about two-thirds the length of central; feathers narrower than in *cinereus* (about .40), and scarcely widening from base to end.

First quill contained not quite three and a half times in longest; the 2d rather shorter than 10th; the 3d a little shorter than 7th; the 1st, 2d, and 3d moderately attenuated at end; the 1st falcate, acute.

Upper surface of body and wings, with jugulum and breast, bluish-ash. Head and neck all round, with nape belly and flanks, yellowish-green, paler



Ptilogonys caudatus, CABANIS. (Costa Rica.)

on throat; the top of head, from bill, pale ashy; chin and forehead anterior to eyes lighter, and tinged with yellowish; the crissum and narrow ring round eye egg-yellow. Tibiæ and concealed tuft on thighs whitish. Quill- and tail-feathers glossy greenish-black; the former edged internally with whitish, the four or five outer tail feathers with a patch of white in the middle third of inner webs, diminishing in size towards the interior one; the outermost with the outlines following nearly the line of the fibres of the feather, or lozenge-shaped, not rectangular. On the fourth feather the spot does not reach the inner edge of the feather, and is still more reduced, sometimes wanting in the fifth. Outer edges of quills very narrowly like back. Bill and feet black. Iris "bluish-yellow" (*Carmiol*).

(No. 35,247, ♀.) Total length, 10.60; wing, 3.80; tail, 5.50; middle feather, 1.90 longer than lateral; difference of 10th and longest quills, .80; exposed portion of 1st primary, .80, of 2d, 1.70, of longest (5th and 6th) (measured from exposed base of 1st primary), 2.80; length of bill from forehead, .60, from nostril, .29, along gape, .75; tarsus, .70; middle toe and claw, .70, claw alone, .23; hind toe and claw, .50; claw alone, .25.

The adults of the two sexes do not appear to differ in color. In younger birds (No. 35,245), however, the bluish-ash is replaced by the yellowish-green, of which color is the entire body and head. In still younger birds there is a strong tinge of brown. In No. 35,245, too, the crest, instead of being broad and full, the lateral feathers as long as central, is pointed, owing to the central feathers being much longer, and more distinct in outline, o[illegible] lateral [illegible] abbreviated, in this respect much like the [illegible] *æ*nope[illegible]

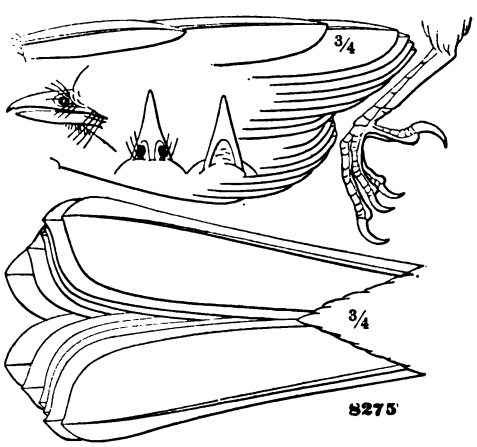
The crest of this species appears longer than in *cinereus;* the tail is very differently shaped in the great prolongation and acuteness of the central feather (almost one-half longer than the lateral), and the graduation of the rest, instead of being nearly even. These feathers, too, are narrower. The outer quills appear rather less attenuated. The principal difference in color consists in the yellowish-green of the head and neck all round, relieved only by the gray of top of head; the ring round eye yellow, not white; the encroaching on flanks and front of belly of the yellowish-green; the lozenge-shaped rather than rectangular patch of white on tail feathers, etc.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
30,500	17	..	San Jose, C. R.	...	Dr. A. v. Frantzius.	.....
33,290	..	..	"	...	J. Carmiol.	.....
33,291	..	..	" [C. R.	...	"	.....
35,245	..	♂	Rancho Redondo,	Aug. 6, '64.	"	.....
35,246	..	♂	"	...	"	.....
35,247	..	♀	"	Aug. 17, '64.	"	.....

PHAENOPEPLA, Sclater.

Phainopepla, Sclater, P. Z. S. 1858, 543. (Type *Ptilogonys nitens*, Sw.)

Plumage rather compact: in the male glossy. Head with a narrow elongated occipital crest. Wings pointed, reaching about to middle of tail. Spurious primary large, broad; more than half second, which is about equal to secondaries; 6th quill longest; 5th, 4th, and then 3d successively shorter; the latter rather shorter than 7th; end of quills not attennated nor pointed. Tail longer than wings; somewhat fan-shaped; rounded at end; not emarginated; the feathers very broad, and widening behind.



Phaenopepla nitens, Sclater. (Arizona.)

Bill not very wide; nostrils with overhanging membrane; frontal feathers bristled, and reaching to hinder edge of nostril; rictal bristles extending to anterior edge; both tips of bill notched. Tarsi about equal to middle toe and claw, or a little longer; distinctly scutellate anteriorly; one or two indistinct divisions on outer side

at lower end. Claws short, much curved. Inner toe cleft nearly to base; basal joint of outer adherent. Outer toe a little longer than inner, reaching a little beyond base of middle claw.

This genus differs from *Myiadestes* in scutellate tarsi, smaller feet, more curved claws, crest, tail, etc. Its relationships to *Ptilogonys* are closer, but the crest is narrow and pointed; the wing less graduated; the first primary much larger; the tail more rounded; the feathers much broader. The bill is much narrower and weaker. The feet are very similar; the toes rather more cleft, though less than in *Myiadestes*.

Phænopepla nitens.

Ptiliogonys nitens, Sw. An. in Menag. 1838, 285.—Bon. Consp. 1850, 335.—Heermann, Jour. A. N. Sc. Phila. II, 1853, 263.—Cassin, Ill. Birds Texas, etc. 1854, 169, pl. xxix.—*Cichlopsis nitens*, Baird, Birds N. Am. 1858, 320, 923.—*Phainopepla nitens*, Sclater, P. Z. S. 1858, 543; 1864, 173 (City of Mexico).

"*Lepturus galeatus*, Less."

Hab. Mountainous portions of western and middle provinces of United States, and south to Orizaba; Cape St. Lucas.

(No. 8,275, ♂.) Tail broad, almost fan-shaped; graduated slightly; not at all emarginate, and longer than wing. First quill broad, slightly falcate, scarcely attenuated; more than half the 2d, which about equals the 10th; 6th longest; 3d equal to 7th. Feathers on nape rather full, with a lengthened, pointed, narrow occipital crest.

Male (No. 8,275) entirely glossy greenish-black; the inner webs of all the primary quills with a large, lengthened patch of white, which does not reach the inner margin; their outer webs very narrowly edged with ashy, as are also lateral tail feathers externally.

Female (No. 8,274) brownish-ash, paler below; the white of inner webs of quills obsolete; the greater coverts and quills edged externally with whitish, the anal and crissal feathers edged and tipped with the same; the outer tail feather with narrow edge of white externally towards end.

Immature birds show every gradation of color between the two extremes described above.

(No. 8,275, ♂.) Total length, 7.60; wing, 3.80; tail, 4.35; difference of 10th and longest primary, .54; exposed portion of 1st primary, 1.20, of 2d, 2.20, of longest (6th) (measured from exposed base of 1st primary), 2.80; length of bill from forehead, .46, from nostril, .31, along gape, .66; tarsus, .70; middle toe and claw, .65, claw alone, .20; hind toe and claw, .44, claw alone, .20.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
18,015	416	♂	Fort Crook, Cal.	April, 1860.	John Feilner.	.....
21,..83	194	♂	Fort Tejon, Cal.	1857.	John Xantus.	.....
8,275	..	♂	Colorado Desert.	...	Lt. Williamson.	Dr. Heermann.
8,274	..	♀	"	...	"	"
11,528	..	♀	Fort Yuma, Ar.	...	Lt. Ives.	H. B. Mollhausen.
26,462	3,248	♂	Cape St. Lucas.	Oct. 10, '59.	John Xantus.	.....
26,463	3,123	♂	"(San Nicholas).	"	"	.....
3,964	..	..	Coahuila, Mex.	1853.	Lt. Couch.	.....
35,132	173	..	Mirador, Mex. (Pine	June, 1864.	Dr. C. Sartorius.	.....
35,133	173	..	..... [region.)	...	.....	.....

(26,463.) Iris fire red.

Subfamily MYIADESTINÆ.

As explained on page 408, I am decidedly of opinion that, notwithstanding a close resemblance in general appearance, *Myiadestes* and *Cichlopsis* should be removed from their usual association with *Ptilogonys*, among *Ampelidæ*, to or at least very near the *Turdidæ*, and form a subfamily with *Platycichla* (p. 32). The latter genus is so closely related to *Cichlopsis* as almost to be the same: *Platycichla* forming the link with *Turdinæ* through *Planesticus*, while such species as *Myiadestes unicolor* show the affinities of *Cichlopsis* to *Myiadestes*.

In the original description of *Cichlopsis*, Cabanis gives scutellate tarsi as a character. In the specimen before me of *C. leucogonys*, belonging to Dr. Sclater, one tarsus is entirely smooth, except the one or two divisions at lower end (as usual in *Turdidæ*), while the other exhibits a faint indication of an additional division. Through the somewhat transparent epidermis may be seen faint transverse lines which may represent such division, but do not come to the surface, and are precisely such as occur among other booted forms. This tendency to occasional abnormal scutellation is a partial monstrosity, or it may be a condition of immaturity, as I have observed in *Myiadestes townsendii*.

The genera of *Myiadestinæ* may be characterized as follows, although I cannot make the diagnoses very trenchant, and must refer to the more elaborate descriptions and comparisons for complete details:—

Myiadestes. Occipital feathers full and soft. Plumage rather loose. Bill weak, much depressed. Commissure nearly straight. Hind toe longer than inner lateral. Toes deeply cleft. Closed wing externally with an exposed light band across the base of the quills, and another nearer the end, separated by a darker one. Tail somewhat graduated on the sides.

Cichlopsis. Occipital feathers short and close. Plumage more compact. Wing without any external marking. Commissure nearly straight. Bill

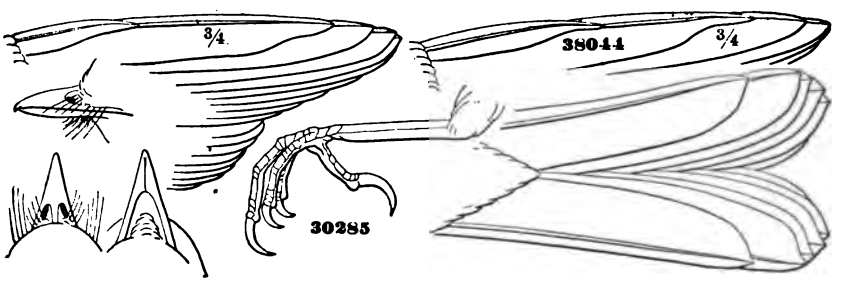
stout, moderately depressed, rectilinear viewed from above. Hind toe and claw shorter than inner lateral. Tail slightly graduated on sides. Throat plain.

Platycichla. Plumage and wing as in *Cichlopsis*. Commissure considerably arched. Bill attenuated; lateral outlines decidedly concave viewed from above; lower mandible much weaker than in *Cichlopsis*. Hind toe and claw longer than inner lateral. Toes more deeply cleft. Tail slightly rounded. Throat streaked.

MYIADESTES, SWAINSON.

Myiadestes, SWAINSON, Jard. Nat. Library, XIII. Flycatchers, "1838," 132. (Type *M. genibarbis*, Sw.)

Plumage soft, loose, and full, especially on the flanks and over thighs. Body slender, depressed; the wings much pointed, and reaching nearly to



Myiadestes solitarius, BAIRD. (Jamaica.)
(Bill and foot natural size; wing and tail three-fourths.)

middle of lengthened tail; about equal to the tail. Bill weak, short and broad, much depressed; the gape very wide; the commissure, which is almost perfectly straight, more than half distance from nostril to tip of bill; ridge well marked; keel less distinct. Culmen straight to near tip, then decurved, hooked, with distinct notch in both tips. Nostrils oval, nearly lateral, with overhanging membrane; the frontal feathers coming to posterior edge, bending more and more forwards and mixed with bristles.

Legs rather weak. Tarsus much compressed, without scutellæ, which are fused into one plate, with perhaps a single division at lower end anteriorly, and one, sometimes two, on outer edge. Toes and claws slender and lengthened; hind claw about equal to middle. Outer lateral toe a little longer than inner, and reaching a little beyond the base of middle. Inner toe cleft to base of basal joint; basal joint of outer entirely adherent; basal joint of middle toe half adherent externally, one-third internally.

Feathers of occiput full and somewhat lengthened, forming a crest. Wing pointed, although the outer quills are graduated. Primary quills ten: the 1st about one-third or less the longest; the 2d equal to 8th or 9th; the 5th longest; the 1st falcate and attenuated; the 2d and 3d attenuated also. Tail somewhat graduated, and also considerably emarginated or forked; this fork not so deep, however, as the graduation.

Myiadestes is a genus embracing a number of species quite similar in character as well as in coloration, and belonging to the mountainous regions of America, including the West Indies. The genus was founded on the *Muscicapa armillatus*, of Martinique, which is probably very similar to *M. solitarius*, of Jamaica, taken here as the type. This, however, is in some respects different from other species, especially in the decided falcation of the first primary, and the attenuation of the tips of the outer two or three quills.

The species vary a little in the width of bill, the angularity of culmen, the length of rictal bristles, the length of outer primary, emargination of tail, etc. One of the most aberrant forms in this respect is *M. elisabeth*, in which the bill is narrower, deeper, and much more Thrush-like in appearance.

The species are all of dull colors, in which ash gray or plumbeous plays a principal part. All exhibit a peculiar pattern of coloration of the wing. The bases of all the quills, except more or fewer of the outer, are white or yellowish, best defined on the secondaries, where the patch is confined to the basal portion, extending more along the inner edges of the primaries, the aggregate showing on the inner edge of the wing as a well-defined patch, just as in the Thrushes. Externally this patch is usually visible just below the greater coverts of primary and secondary quills, although generally altered in color, and is then succeeded by a dusky bar, and then again by another bar like the first, which however is confined to the outer webs of the quills. These two bars, sometimes pale yellowish, sometimes plumbeous, separated by a dark one can be traced more or less distinctly in all the species. In all likewise the tail is whitish or grayish on its outer edge and on the tips of the more lateral feathers. The bill and legs are sometimes dusky, sometimes yellowish.[1]

COMMON CHARACTERS.—General color ashy blue or gray (except in *Myiadestes elisabeth*, which is olivaceous above and whitish beneath); the wing with conspicuous light patch across quills at base inside, less evident externally, where there is a second light bar separated from the first by a dusky one. (*M. leucotis* is rufous above, black beneath, with white patch at base of quills.)

[1] As these sheets are passing through the press, the Smithsonian Institution has received a specimen of *M. leucotis* of Tschudi, from Peru, presented by the Museum of Neuchatel, which proves to be quite aberrant in shorter, more rounded wings, longer bill, stouter legs, and different pattern of coloration of the wing. It may reasonably constitute the type of a different genus or subgenus, but I do not at present propose to name it as such. The general characters will be found in the diagnostic table, and a full description farther on.

A. Pattern of coloration beneath decidedly and abruptly varied.

Body slaty blue; chin and throat, with crissum, orange brown, abruptly defined. A patch of white on under eyelid. Bill black.

Extreme point of chin and sides of base of lower jaw each with an almost inappreciable and not continuous white spot. Ears blackish, not varied. Thighs slate color; legs yellow. Length, 7.50 . . . . . *solitarius.*

Whole chin, continuous with a large patch on side of lower jaw (without dusky border below?), white. Ears not varied? Lower part of thighs yellow; legs brown? Length, 6.25 *armillatus.*

A white stripe along lower part of cheeks, bordered beneath by a blackish line. Ears streaked black and white. No white on chin? nor yellow on thighs? Legs pale. Length, 7.00 . . . . . *genibarbis.*

B. Whole under parts nearly uniform (plumbeous or ashy), varied only slightly in shade (black in *leucotis*).

Prevailing color ash gray; chin, upper throat, and crissum paler. A white ring round the eye; lores, and a line each side the chin dusky. Bill black; legs dusky.

Upper parts uniform ash gray, the two light wing patches very distinct, and fulvous yellow. Maxillary stripe indistinct . . . . *townsendii.*

Outer surface of wings rufous brown, back less conspicuously so. Wing bands indistinct. Maxillary stripe well marked . . . *obscurus.*

Above rufous; under parts dark plumbeous.

Forehead ashy; top of head less rufous. Wing bands quite distinct. Upper mandible black; lower, with legs, yellow . . . . *venezuelensis.*

Nearly uniform slaty blue all over.

Forehead ashy; chin paler than rest of under parts. Bill black; legs dusky . . . *unicolor.*

Forehead, face, and chin black. Bill orange red; legs yellow . . . . . *melanops.*

Above grayish-olive; dull white beneath.

A dusky line each side chin. Bill narrow, thickened, black, with the base below, as also the legs, yellowish . . . . . *elisabeth.*

Above rufous; under parts black.

Cheeks, axillars, inside of wing, and patch at base of quills (not visible externally) white ternal wing band obsolete. Bill black yellow beneath . . . .

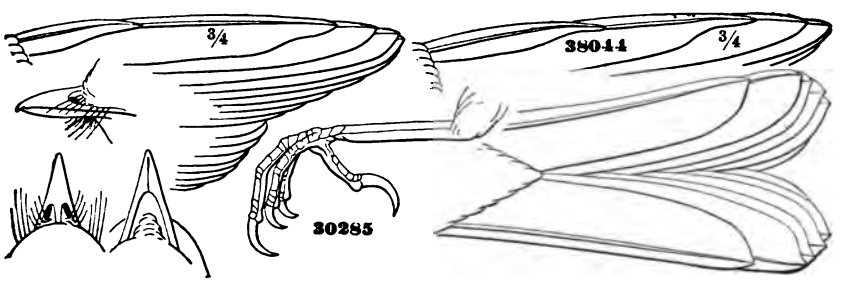
The species of South American *Myiadestes*, mentioned in the foot-note, I have not been able to examine.[1]

Myiadestes solitarius.

Myiadestes solitarius, BAIRD, n. s.

Muscicapa armillata, GOSSE, Birds Jam. 1847, 198 (not of VIEILLOT).—*Ptilogonys armillatus*, GRAY & MITCHELL, Gen. Birds, I, pl. 69.—SCLATER, P. Z. S. 1861, 73.—*Myiadestes arm.* SCLATER, P. Z. S. 1857, 6.—IB. Catal. 1861, 47.—MARCH, Pr. A. N. Sc. Phila. 1863, 294.

Hab. Jamaica.



Myiadestes solitarius, BAIRD. (Jamaica.)

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[1] **Myiadestes griseiventer.**

Ptilogonys griseiventer, TSCH. Arch. Nat. 1844.—IB. Fauna Peruana, 1846-7, 140.—*Myiadestes griseiventer*, CAB. Arch. Nat. 1847, I, 209.

Rufous olive; forehead cinereous; cap olivaceous, with some rufous spots. Upper wing coverts black, the outer web and tip edged with rufous; primaries brown, edged externally with olive; secondaries with inner webs white at base. Beneath gray; crissum rufous. Middle tail feathers like the back, the two outer with hinder part of inner web white, the others black, tipped with white.

Bill blackish-brown; lower jaw paler in middle. Legs yellowish-brown. Irids blackish-brown.

Length, 6.80; tarsus, .83; tail, 3.33; wings, 3.82.

Myiadestes ardesiaceus.

Myiadestes ardesiaceus, LESS. Desc. Mamm. et d'Ois. (Œuvres Comp. de Buffon, ed. Didier, 1847, VII), 1847, 319. Brazil.

Bill black; tarsi brown. Body above brownish-slate; cheeks, fore part and sides of neck, sides of breast and flanks dusky brown; the middle of body, from thorax to lower tail coverts, white, tinged with very pale yellow; thighs brown. Length, 16 centimetres.

This bird has not been identified as a *Myiadestes* by authors, and may belong to another genus, especially as Lesson places in the same genus with it the *Setophaga ornata* of Boiss.

(No. 30,285, ♂.) Wing pointed, but decidedly shorter than the tail; the 1st quill falcate, acute, one-third the longest; the 2d rather shorter than 7th, sinuated and somewhat attenuated at end; 5th quill longest. Bill much depressed; rictal bristles lengthened. Tail considerably graduated, but slightly emarginated.

Above clear slaty blue; rather paler beneath, and lighter towards the belly. Chin and throat, anal region, and crissum dark cinnamon red. Lower eyelid, extreme angle of chin, and small patch on side of lower jaw white; loral region, and cheeks below eye black. Edge of wing, and patch at base of quills whitish, as seen on inner face of wing; externally this patch is ashy, followed by the usual blackish bar, and the ashy one beyond that. Lateral tail feather whitish, except base and outer web at end; the next feather with a long patch at end of inner web, and the tip white; remaining feathers blackish, the central like back. Bill black; legs yellow. "Irids hazel or dull orange" (*Gosse*).

(No. 30,285, ♂.) Total length, 7.70; wing, 3.55; tail, 4.20; graduation, .60; emargination, .15; difference between 10th and longest quills, .80; exposed portion of 1st primary, .94, of 2d, 2.30, of longest (5th) (measured from exposed base of 1st primary), 2.80; length of bill from forehead, .56, from nostril, .30, along gape, .69; tarsus, .85; middle toe and claw, .81, claw alone, .24; hind toe and claw, .55, claw alone, .25.

In No. 38,044 the first quill is much longer (nearly one-half the third), and much attenuated at end; the second quill also unusually attenuated. (See figure.)

This species has, by later authors, been identified as the *Muscicapa armillata* of Vieillot, although erroneously. Vieillot's species is given in Ois. Am. Sept. as inhabiting "the Antilles," but in Encyclop. Méthodique he assigns it to Martinique. The white of chin and side of jaws, the rufous belly, the yellow of legs and the brown feet, with a length of $6\frac{3}{4}$ inches, as given by Vieillot, are not to be found in the Jamaican bird. As far as I can determine it has never been named, and I apply to it the name of *solitarius*, from the account by Gosse of its habits.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
23,327	..	..	Trelawney, Jam	Jan. 19, '59.	Dr. Sclater.	W. Osburn
23,328	..	♀	"	"	.....	.....
38,044	55	♂	Spanishtown, Jam	Mar 18, '65.	W. T. March.	.....
30,285	..	♂	Port Royal Mts. "	"	"	Mr. Colchester.
30,286	..	♀	"	"	"	"

Myiadestes armillatus.

Muscicapa armillata, Vieillot, Ois. Am. Sept. I. 1807, 69, pl. 42 ("Antilles").—Is. Nouv. Dict. XXI. 448.—Is. Encyc. Méth. II. 824 ("Martinique").—?*Myiadestes armillata*, Bon. Consp. 1850, 335.

Hab. "Martinique."

"Bill blackish; a white spot on the sides of the throat, and at its origin (the chin) immediately below the lower mandible (the two continuous); the eye surrounded by the same color. Head, back, rump, two intermediate tail feathers, and the breast of a grayish-slate, paler below. Wing- and tail-feathers blackish, bordered externally by gray, the three lateral on each side of the tail more or less white. Belly and hinder parts brownish-rufous; a beautiful yellow in form of a bracelet on the feathers of lower part of leg; feet brown. Length, 6 inches 3 lines." *Vieillot*, Ois. Am. Sept. I, 69.

"Young, before the first moult, grayish-ash above; head brown with yellowish spots; feathers of throat and hinder parts blackish at their extremity, and yellowish elsewhere." *Vieillot*, Encyclop. Méth. II, 824.

According to Vieillot this species is found in Martinique, where it dwells in the elevated regions, and on account of its remarkable note is known as the "*Musicien*" or "*Siffleur de la Montagne.*"

The differences between Vieillot's description and the Jamaican bird usually called *armillatus*, have already been referred to. Vieillot's figure represents the tail as more rounded; the legs longer and distinctly scutellate, which, however, may be an error of the plate.

Myiadestes genibarbis.

Myiadestes genibarbis, Sw. Jard. Nat. Libr. XIII. Flycatchers, 1838, 134, pl. xiii.

Hab. Some one of the Windward Islands of the Lesser Antilles?

General appearance that of *M. solitarius*, of Jamaica. Whole upper parts lead blue; wings and tail marked as in the other species of its section. The throat and upper part of jugulum, the crissum, anal region, belly, and flanks are brownish-red or rufous. The breast is plumbeous, paler than the back. A narrow, dusky or blackish line from the lower edge of the mandible borders the rufous of throat, and cuts off a mandibular stripe, which is reddish-white as far as the eye, but then becomes mixed with blackish, and passes again as far as the end of cheeks into rufous like the throat. The extreme chin is also reddish-white, though somewhat separated from that of side of lower jaw by the dusky line mentioned. The ear coverts are blackish, each with a central streak of whitish, sometimes tinged with reddish. A whitish patch on under eyelid. The axillars are pale rusty, the tibia plumbeous. Legs yellow. Bill black.

Total length, 7.00; wing, 3.40; tail, 3.70; exposed portion of 1st primary, .81, of 2d, 2.12, of longest (4th) (measured from exposed base of 1st primary), 2.60; length of bill from forehead, .55, from nostril, .25, along gape, .75; tarsus, .86.

This species, though in general, similar to *M. solitarius*, is still very appreciably different. Its most striking peculiarity is in the dusky line each side the throat, cutting off above it a stripe, first reddish-white, then mixed with dusky, and then rufous like the throat, this color reaching to posterior end of ear coverts. The ear

coverts instead of being nearly unicolor, are conspicuously streaked with whitish. The rufous of throat extends farther down, that of belly and flanks farther forwards, reducing the plumbeous of under parts very materially, and confining it mainly to the breast. The chin is whitish for a considerably greater extent. The axillars are pale rufous, instead of ashy. The size is less: the form much the same.

The present species approaches most closely to the description of *M. genibarbis*[1], by Swainson, but differs apparently in some appreciable characters. The black streak on each side the throat, in *genibarbis*, cuts off a stripe which is continuously white to the end of ear coverts, instead of becoming mixed with dusky on the middle third and changing then to rufous. The rufous of *genibarbis* does not extend as far forward, showing much less on the belly and flanks. In the uncertainty, however, as to whether Swainson described his specimen accurately or not, I will, for the present, make use of his name.

The *M. armillatus*, of Vieillot, appears to differ in much greater extent of whitish on chin and side of lower jaw, in absence of the dusky mandibular stripe and white streaks on the ears, and in the yellow band on the tibia. It is possible, however, that the two may be identical; but the differences of *M. solitarius*, as a separate species, is beyond a doubt.

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[1] **Myiadestes genibarbis**, Sw. Jard. Nat. Library, XIII. Flycatchers, 1838, 134, pl. xiii.

Hab. ————?

"Above clear cinereous; all under parts not red are of same color, but much paler; a whitish maxillary stripe, bordered by a black line (below), and the ears are black, striped with white lines. External edges of the wing feathers gray, except terminal half of primaries and a black band at basal half of secondaries; lateral tail feathers black, having ends of inner webs more or less white, the outermost almost entirely white, with outer edges of that and the next gray; the middle pair wholly cinereous. Under plumage from chin to throat bright rufous; which color descends a little on the breast, and is bordered on each side the chin by the black maxillary stripe resembling a whisker already mentioned; breast and sides cinereous, nearly of as dark a tint as the back; as this color descends, however, it becomes paler and blends into the rufous of the belly, vent, and under tail coverts; bill deep black, legs very pale. Total length about 7.00; bill along gape, .70, front, .40, wings, 3.40, tail beyond, 2.00, from base, 3.00; tarsus, .80."

The locality of the specimen described is a matter of uncertainty—Swainson supposing, from its apparent affinities, that might have come from Africa. It is evidently, however, West Indian.

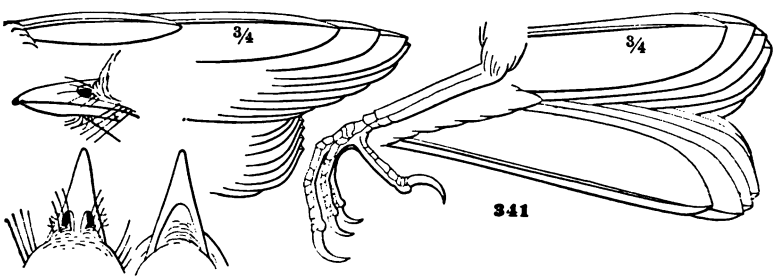
Of this species there are three specimens in the museum of the Philadelphia Academy; the best and that described labelled "Trinidad," another much duller in coloration marked "Brésil," and the third without any locality. Both indications are doubtless incorrect, the species belonging more probably to some one of the larger, more mountainous of the Windward islands of the Lesser Antilles."[1]

Myiadestes elisabeth.

Muscicapa elisabeth, LEMBEYE, Aves de la Cuba, 1850, 39, pl. v, fig. 3 ("Riusenor," Cuba).—*Myiadestes elisabeth*, CAB. Jour. IV, 1856, 2 (rocky mountains of western Cuba).—GUNDLACH, Ann. N. Y. Lyc. VI, 1858.—IB. Cab. Jour. 1861, 328.

Hab. Cuba.

(No. 25,911.) Tail rather longer than wing, slightly emarginated; quite graduated. Wing moderately pointed; 1st quill broad to tip, very slightly



Myiadestes elisabeth, LEMBEYE. (Cuba.)

falcate, not pointed; nearly half the 2d quill, which is also broad, and shorter than 7th, about equal to 8th; the 4th longest; then 5th, 6th, 3d. Bill narrow and deep for the genus, differing from the rest of species; rictal bristles lengthened.

Above uniform brownish-olive, more ashy on rump; beneath dull white; the sides of neck ashy; the breast, sides, axillars, and perhaps crissum tinged with the same. Eyelids fulvous yellow; cheeks below eye dusky, and a narrow dark line each side the chin; ear coverts more fulvous. The inner wing coverts and tips of longer axillars fulvous. The usual light patch at

[1] Since writing the preceding article I have had the opportunity of examining three specimens of the species in the Lafresnaye Collection (4,433, 4,434, 4,435), recently purchased by Dr. Bryant, and presented to the Boston Society of Natural History. These have a general resemblance to the bird just described, excepting that in one there is a trace of rufous in the tibial feathers. They are labelled "Martinique or South America," and are evidently not authenticated as to locality. A young bird among them (No. 4,335) has the entire under parts brownish-red, with blackish edges to the feathers, the upper parts similarly spotted.

base of quills, visible internally as a yellowish-white bar across the wing, externally as a fulvous brown bar followed by a blackish one, and again a fulvous. In other words, the olive of upper parts is varied on the wings by having the outer webs of quills, except outer primaries, fulvous olive, crossed near the base by a broad blackish bar. Central tail feathers like back; others blackish; outermost ashy for most of length, and like next, tipped with white. Bill black; the base below white. Legs flesh color?

(No. 25,911, ♂.) Total length, 7.50; wing, 3.55; tail, 3.80; graduation of tail, .25; difference of 10th and longest quill, .66; exposed portion of 1st primary, 1.00, of 2d, 2.15, of longest (5th) (measured from exposed base of 1st primary), 2.60; length of bill from forehead, .56, from nostril, .31, along gape, .70; tarsus, .82; middle toe and claw, .78, claw alone, .26; hind toe and claw, .52, claw alone, .26.

Smithsonian No.	Collector's No	Sex and Age.	Locality.	When Collected.	Received from	Collected by
25,911	..	♂	Cuba.	...	Dr. J Gundlach.	.....
21,645	..	♀	Donna del Gate,	Dec. 11.	Chas. Wright.	.....
21,670	..	♂	" [Cuba.	...	"	.....
21,646	..	♂	"	...	"	.....
23,543	..	..	Monte Libano, Cuba.	Sept. 24.	"	.....
23,542	..	..	.....	"	.....	.....
341	..	♂	Cuba.	...	Cab. Lawrence.	.....

Myiadestes melanops.

Myiadestes melanops, SALVIN, P. Z. S. 1864, 580, pl. xxxv (Tucurrique, Costa Rica).

Hab. Costa Rica.

(No. 30,501.) Wing moderately pointed; 1st quill about one-third the longest; 2d scarcely longer than 8th; 4th and 5th longest.

Above bluish-slate color; rather lighter below; middle of belly somewhat paler. Forehead, cheeks anterior to eyes, and chin black; axillars whitish at ends, the bases of the quills showing the usual patch on the inner face of wing, which in this species is white; externally it is ashy, scarcely appreciable, and followed by the usual dusky bar. Quill- and tail-feathers blackish, the central of the latter scarcely more ashy, as is the case in the terminal portion of the outer two feathers and the outer edges of the outermost; both obscurely tipped with whitish. Bill reddish-yellow; legs and feet clear yellow.

(No. 30,501.) Total length, 7.25; wing, 3.60; tail, 3.45, graduation, 40, emargination slight; difference of 10th and longest quills, .70; exposed portion of 1st primary, .90, of 2d, 2.30, of longest (4th) (measured from exposed base of 1st primary), 2.75; length of bill from forehead, .60, from nostril, .30, along gape, .70; tarsus, .81; middle toe and claw, .79, claw alone, .24; hind toe and claw, .58, claw alone, .28.

In some specimens the pure clear bluish-plumbeous of back is faintly glossed behind with olive brown. Young birds have the bill

black, except at the base below, or else black at tip; all the feathers with a central spot of ochraceous-yellowish, bordered by blackish, traces of these spots occasionally visible in adults.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
30,501	31	..	Costa Rica.	...	Dr. A. v. Frantzius.	.....
33,293	32	..	"	...	"	.....
30,503	33	♀	"	...	"	.....
30,502	34	..	"	...	"	.....
33,294	119	..	"	...	"	.....
35,343	..	♂	Dota, C. R.	July 17 '64.	J. Carmiol.	Iris yellow.
35,244	..	♀	Rancho Redondo.	Nov. 15, '64	"	.....

Myiadestes venezuelensis.

Myiadestes venezuelensis, SCLATER, Ann. Mag. Nat. Hist. 2d ser. XVII, 468.—IB. P. Z. S. 1857, 6; 1860, 64 (Ecuador).—IB. Catal. 1861, 48, no. 290 (Bogota).

Hab. Venezuela, Bogota, and Ecuador.

(No. 32,513.) First quill about two-fifths the longest; nearly half the 2d, which is rather shorter than 7th; 4th and 5th longest.

Above dark rusty brown, brightest towards rump. Forehead (shading off into the olivaceous rufous of cap), cheeks, and under parts, including lining of wings and axillars, dark slate color, becoming paler behind; the tibiæ, flanks and end of crissum somewhat tinged with olivaceous rufous (sometimes scarcely appreciable). Lores dusky. As in most species, a band of light fulvous at bases of quills, distinctly seen on the inside of wing; scarcely appreciable externally, and followed by a dusky bar. Middle tail feathers somewhat like back, but with a purplish tinge; other feathers purplish-black, the outermost gray for most of outer web, the next to a less extent, both with a patch of white at end of inner web. Bill dusky above, yellow beneath; feet yellow.

(No. 32,513.) Total length, 7.20; wing, 3.30; tail, 3.25; difference of 10th and longest quills, .70; exposed portion of 1st primary, .95, of 2d, 2.16, of longest (4th) (measured from exposed base of 1st primary), 2.60; length of bill from forehead, .55, from nostril, .26, along gape, .69; tarsus, .80; middle toe and claw, .75, claw alone, .21; hind toe and claw, .56, claw alone, .23.

This species agrees sufficiently well in form with the Mexican, but has shorter and more rounded wings; a proportionally longer first primary, and perhaps a more even tail. The yellow mandible, darker rufous of back extending to head, dark slate of throat, and absence of white or dark lines about the head readily distinguish it from *M. obscurus*, most nearly allied in color.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
32,513	..	..	Puerto Cabello, Ven.	...	J. Krider.	.....
32,514	..	..	"	...	"	.....
24,944	..	..	Bogota.	...	L. de Geofroy.	.....

Myiadestes unicolor.

Myiadestes unicolor, SCLATER, P. Z. S. 1856, 299 (Cordova); 1857, 5, 213 (Orizaba); 1858, 97.—IB. Catal. 1861, 47, no. 289.—SCLATER & SALVIN, Ibis, 1860, 397 (Coban).

Hab. Central Mexico and Guatemala.

(No. 22,377, ♀, type.) Second quill rather shorter than 7th; 4th and 5th longest, and about equal; 1st about one-third the longest.

General color dark slate color, paler below (darkest on jugulum and breast); chin and anal region lighter. Eyelids white; lores and cheeks dusky. Tail feathers black, except central, which are like the back, the outermost which is ashy except at base, and the second feather which has the end and a portion of inner web ashy, the extreme tips of the two last mentioned feathers whitish. Quills with a band of dull fulvous across their bases, shown very obscurely externally as a transverse wing-bar, followed by a blackish one. Bill black; legs hazel.

(No. 22,377, ♀.) Total length, 7.50; wing, 3.80; tail, 3.70; difference between outer and fourth tail feathers, .50; difference between 10th and longest quills, .85; exposed portion of 1st primary, 1.00, of 2d, 2.50, of longest (4th) (measured from exposed base of 1st primary), 3.00; length of bill from forehead, .60, from nostril, .30, along gape, .76; tarsus, .85; middle toe and claw, .80, claw alone, .22; hind toe and claw, .60, claw alone, .26.

This species in form resembles *M. obscurus*, although in coloration is more like *townsendii*, from which the prevailing dark slate (not grayish-ash), and the absence of the distinct cinnamon bars across the quills readily distinguish it. The pattern of coloration of quills is as in *townsendii*, but the want of contrast in the tints renders this almost inappreciable in the prevailing dark slaty plumbeous of upper parts. The axillars and inner lining of wings are slate, like the breast; but the pale fulvous band at base of quills is very well marked in the inside of wing.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Remarks.
22,377	..	♀	Cordova, Mex.	...	Verreaux.	Type.
30,720	..	..	Choctum, Vera Paz.	Jan. 1860.	O Salvin.	Compared with type.

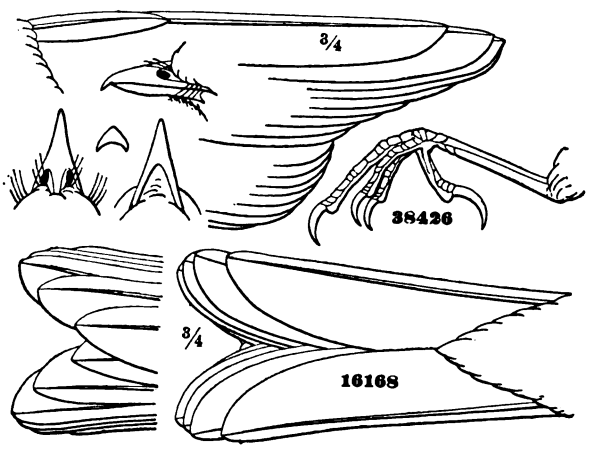
Myiadestes townsendii.

Ptiliogonys townsendii, AUD. Orn. Biog. V, 1839, 206, pl. 419, fig. 2. (For other references see Birds N. Am. 321).—NEWBERRY, P. R. Rep. VI, Whipple's Rep. Zool. 82.—*Culicivora towns.* DEKAY, N. Y. Zool. II, 1844, 110.—*Myiadestes towns.* CABANIS, Wieg. Arch. 1847, I, 208.—SCLATER, P. Z. S. 1857, 5; 1858, 97.—BAIRD, Birds N. Am. 1858, 321.—COOPER & SUCKLEY, P. R. Rep. XII, II, 187.—KENNERLY, P. R. Rep. X, Whipple's Rep. 25.—LORD, Pr. R. Art. Inst. Woolwich, IV, 116 (Br. Col.).

Hab. Mountainous regions of middle and western United States. (Not found at Cape St. Lucas nor in Mexico.)

(No. 16,168.) Second quill shorter than 6th; 3d rather longer than 5th; 4th longest. Wings much pointed, as long as the tail, which is forked, and the lateral feathers graduated.

Prevailing color dark ash gray, scarcely lighter on breast, paler on abdomen, mixed with paler dull whitish-gray on chin, throat, belly and crissum; the ends



Myiadestes townsendii, CAB.

of axillars, inner wing coverts, edge of bend of wing, outer web of lateral and tips of outer tail feathers, dull white. A white ring round the eye; the loral region and cheeks below eye blackish. Quill- and tail-feathers dark brown; the central tail feathers more like back, the lateral edged and tipped as described. All the quills with a broad, well-defined patch of light cinnamon at their bases; which in the outer five are not visible across the outer webs, but show distinctly externally on the rest. A second less distinct but broader band of similar color (brightest on the primaries) crosses the outer webs of the same quills nearer the end, the two bands separated by a blackish one. Outer edges of inner secondaries grayish-white. Bill black; feet dusky.

No appreciable difference in the sexes; the young bird thickly spotted with pale ochrey.

(No. 16,168.) Fresh specimen: Total length, 8.10; expanse of wing, 13.20; wing from carpal joint, 4.50. Prepared specimen: Total length, 8.00; wing, 4.40; tail, 4.40, depth of fork, .42; difference between 10th and longest primary, 1.22; exposed portion of 1st primary, 1.00, of 2d, 3.00, of longest, 4th (measured from exposed base of 1st primary), 3.45; length of bill from forehead, .60, from nostril, .30, along gape, .71; tarsus, .80; middle toe and claw, .80, claw alone, .24; hind toe and claw, .50, claw alone, .26.

On the chin and crissum the tips of feathers are much lighter than the ashy bases, producing a mixture of the two colors, although this is scarcely appreciable in some specimens. There is a very faint indication occasionally of a dusky line on each side of the chin, as in *M. obscurus*.

Young birds have a large triangular pale ochraceous light spot on the end of each feather (rather paler below), bounded externally by a narrow border of blackish; the quill- and tail-feathers as in the adult.

The more important localities of specimens before me are as follows:—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
2,922	..	..	Columbia River.	...	S. F Baird	J. K. Townsend.
8,285	..	♀	Fort Steilacoom.	...	Dr G. Suckley.	.....
16,164	..	♀	Fort Crook, Cal.	...	Jno. Feilner.	.....
21,942	623	..	Kootenay River.	Aug. 1860.	A. Campbell.	Dr. Kennerly.
21,943	612	♂	Flathead River.	Sept. 8, '60.	"	"
19,225	162	..	Pumpkin Butte.	Oct. 22.	Capt. Raynolds.	Dr. Hayden.
11,056	..	♀	Fort Bridger, Utah.	May 6.	C. Drexler.	.....
18,325	..	♂	Hellgate, Id.	1860.	Lt. Mullan.	Jno. Pearsall.
38 427	..	..	Laramie Peak.	1864.	Dr. Hitz.	.....
8,286	..	..	Zuñi.	...	Lt. Whipple.	Dr. Kennerly.

(2,922) Type of species.

Myiadestes obscurus.

Myiadestes obscurus, LAFR. REV. Zool. 1839, 98 (Mexico).—SCLATER, P. Z. S. 1856, 300 (Guatemala); 1857, 5, 213 (Orizaba); 1859, 364 (Jalapa); 376 (Oaxaca; eggs).—IB. Catal. 1861, 47, no. 288.—BON. Consp. 336.—SCLATER & SALVIN, Ibis, I, 1859, 14 (Guatemala).

Hab. Mountainous regions of Mexico, into Guatemala; Tres Marias Islands.

(No. 37,500.) Wing about equal to tail, which is emarginate and rounded. Fourth quill longest; 5th and 3d a little shorter; 2d longer than 7th; 1st two-fifths the 2d.

Back olivaceous-rufous, more olive on rump and upper tail coverts: the outer surface of wings, including edges of quills, more rufous cinnamon. A pale cinnamon concealed patch at base of inner webs of quills, abruptly defined on the secondaries, fading out gradually in the primaries along their inner edges. Head, neck, and under parts plumbeous-ash (the latter less pure). Chin (fading out gradually into the ash of throat), sides of lower mandibles (separated from chin by a black line), and line from nostril to above eye, with middle of belly, dull white; eyelids pure white, the loral region dusky, the cheeks below the eye blackish. Tail black, excepting

the two central feathers which are plumbeous-ash, and the exterior which is light ash, blackish at the base; the next feather also ashy towards the tip, both feathers with a narrow tip and a border of white along the end of inner web. Axillars and inner face of wings tinged with fulvous. Bill black; feet pale hazel. "Irids red brown" (*Xantus*).

(No. 37,500.) Total length, 7.80; wing, 4.20; tail, 4.10; difference of outer and 5th (longest) tail feather, .5, difference of innermost and 5th, .25; difference of 10th and longest quills, 1.00; exposed portion of 1st primary, 1.00, of 2d, 2.65, of longest (4th) (measured from exposed base of 1st primary), 3.12; length of bill from forehead, .61, from nostril, .30, along gape, .84; tarsus, .81; middle toe and claw, .79, claw alone, .29; hind toe and claw, .54, claw alone, .30.

The outer webs of the quills are of a darker rufous than elsewhere on the upper surface. The rufous on secondaries reaches the shaft, except about the middle, where there is only a narrow edge bordering a blackish patch like the inner web. On the outer primaries the inner portion of the whole outer web is dusky, bordered externally by rufous cinnamon, diminishing in amount exteriorly, and not appreciable on the outer two quills.

Specimens vary considerably in intensity of the rufous of the back, which is sometimes very bright, at other times much duller. Occasionally, as in No. 35,038, the whitish line from bill to eye meets its fellow, forming a pale frontal band, the same specimen having the upper part of back ashy, like the head and nape. Sometimes there is a wash of fulvous olive on the flanks, which again are entirely ashy. As far as the materials before me show, it is in specimens from western Mexico, Tonila, and Tres Marias, that the ash of head invades the back: the rufous of back paler; the tail also appears longer (4.40 in No. 37,327, Tres Marias).

This species is quite similar to *M. townsendii*, although the wings are shorter and less pointed. It is readily distinguished by the reddish of the back and wings; the dulness of the two transverse light cinnamon or fulvous bars across the quills, with the intervening black one; the ashy, not whitish edge of the tail; the whitish line from nostrils to above eye, and the black line bordering the chin.

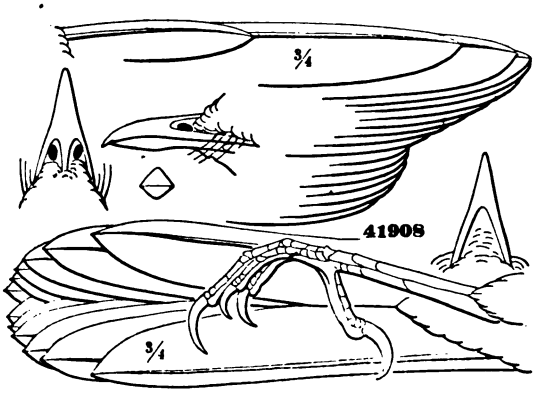
Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by.
37,327	60	♂	Tres Marias Islands,	Jan. 1865.	Col. A.J. Grayson.	.....
37,328	59	♂	" [Mex.	"	"	.....
35,038	2,219	♂	Tonila, Jalisco.	Oct. 1863.	J. Xantus.	.....
37,500	82	..	Orizaba, Mex.	...	Prof. Sumichrast.	.....
37,501	81	..	"	...	"	.....
22,378	17,271	..	Mexico. [Guat.	...	Verreaux.	.....
30,722	4,405	..	Volcan de Fuego,	Nov. 1861.	O Salvin.	.....

Myiadestes leucotis.

Ptilogonys leucotis, TSCH. Arch. Nat. 1844.—IB. Fauna Peruana, 1846–7, 139, pl. vii, fig. 1. *Hab.* Peru.—*Myiadestes leucotis*, CAB. Arch. Nat. 1847, I, 209.

Hab. Peru.

(No. 41,908, Peru.) Above cinnamon brown; the top of head and entire under parts black, except the flanks, which are like the back, and a patch on



Myiadestes leucotis, CAB. (Peru.)

the sides of breast under the wing, which is white; the cheeks also are white. The quill- and tail-feathers are sooty black, even including the shafts; the innermost secondaries not so dark, and like the wing coverts, washed externally with cinnamon. Exposed upper surface of central tail feathers tinged with a faint shade of cinnamon, the terminal half of outermost, and a large patch in the end of next, grayish-white. The axillars, inner wing coverts, and a quadrate patch at base of inner web of all the quills, except the 1st primary and innermost secondaries, white, the color reaching to the shaft, but not visible externally. Upper mandible and legs black; lower mandible yellow. "Iris fiery red" (*Tschudi*).

Wings rather shorter than the tail, considerably rounded; the first primary large and broad, not falcate, about half the 2d, which about equals the 8th; the 4th and 5th longest. Tail somewhat graduated, the feathers acute and acuminate at tips; the outer tapering from about its middle. Bill lengthened; commissure nearly straight, but slightly sinuated towards base; nostrils broad and open. Legs stout; tarsus about equal to middle toe and claw, without distinct scutellar divisions anteriorly except below; a few faint and obsolete transverse divisions on outer side. Inner toe separated to base, the basal joint of middle toe united for rather more than basal half to outer toe; claws all rather large.

(No. 41,908.) Total length, 9.00; wing, 4.25; tail, 4.55, its graduation, .65; difference of 10th and longest primary, .75; exposed portion of 1st primary, 1.42, of 2d, 1.75, of longest (4th and 5th) (measured from exposed base of 1st primary), 3.30; length of bill from forehead, .74, from nostril, .40 along gape,

.96 ; tarsus, .96 ; middle toe and claw, .96, claw alone, .29 ; hind toe and claw, .67, claw alone, .32.

This bird constitutes a peculiar form among *Myiadestes*, differing in certain characters which probably are of generic value. The bill is much longer, and proportionally narrower, than in the others; the feet and claws stouter. The wing is more rounded, without any falcation or acumination of the outer quills, and differing especially in the large first primary, which is half the length of the second. In this respect it is nearest to *M. venezuelensis*. The absence of the peculiar markings in the wings, seen in the other species, is noteworthy. The shape and markings of the tail, however, are much as in true *Myiadestes*.

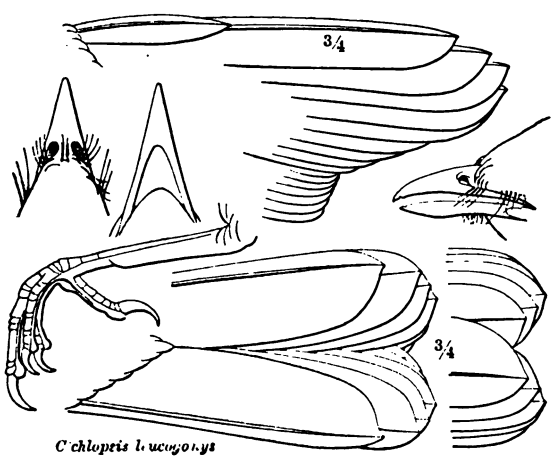
It is possible that a more perfect condition of the feathers may show either a diminution or an increase of the differences referred to, and I await better specimens before attempting to decide upon the claims of the species to generic rank. In some respects there is a relationship to *Cichlopsis*.

The specimen described above is one of Mr. Tschudi's types, presented to the Institution by the Museum of Neuchâtel. It is moulting a considerable portion of its feathers, which somewhat obscures its characters, and it may even be a young bird not yet arrived at maturity.

CICHLOPSIS, Cabanis.

Cichlopsis, Cab. Mus. Hein. I, 1851, 54. (Type *C. leucogonys*.)

General appearance Thrush-like. Wings quite pointed, about equal to the tail; outer primary about two-fifths the 2d, which is longer than 7th, the tips



Cichlopsis leucogonys

28 June, 1866.

not attenuated. Tail emarginated, and still more rounded. Bill rather stout, and somewhat Thrush-like; broad, much depressed, and with mouth deeply cleft, much as in *Myiadestes*, but deeper and stouter in proportion. Gonys about two-fifths the lower edge of lower mandible. Frontal and rictal bristles well developed. Feet short; tarsus about equal to middle toe, without scutellar division, excepting two plates at lower end, both sides of which also exhibit slight indication of similar division. Lateral toes about equal, their claws reaching to base of middle claw. Basal phalanx of middle toe united for a very little more than half to rather less than half the basal phalanx of inner toe, and for two-thirds its length to one and a half joints of outer: this phalanx a little shorter than the basal of inner toe.

The relationship of this genus to *Myiadestes* is very close, and seems to connect the group with the *Turdidæ*. The body is fuller; the basal joints of the middle toes a very little more united; the bill stouter, stronger, and deeper; the plumage more compact, and the wing lacks the peculiar pattern across the base and outer edges of the quills, having instead the lighter rusty edgings at the base inside, so common in the *Turdidæ*. The outer quills lack the attenuation of typical *Myiadestes*, but resemble almost exactly those of *M. unicolor*. In fact the only tangible differences are in the stouter bill, rather more united toes, more compact plumage, and absence of wing pattern.

Dr. Cabanis gives, as one of the characters of *Cichlopsis*, the tarsi distinctly scutellate. In Dr. Sclater's specimen, however, the tarsi are as much booted as in the genuine Thrushes. The basal joints of the middle toe are united a very little more than in *Turdidæ;* but, on the other hand, in *Myiadestes* proper, these are as deeply cleft as in the Thrushes.

The young of *Cichlopsis* are probably spotted, as in *Myiadestes*, judging from the indications of the adult.

Cichlopsis leucogonys.

Cichlopsis leucogenys, CAB. Mus. Hein. 1850–1, 54 (Brazil).

Cichlopsis leucogonys, "CAB.," SCLATER, P. Z. S. 1857, 6; 1858, 542 (rectification).—IB. Catal. 1861, 48, no. 291.

Myiadestes leucotis, BON. Consp. 1850, 336 (not of TSCHUDI).

Myiocichla ochrata, BON. Comp. Rend. XXXVIII, 1854, 6, and Notes Del. 30 (Brazil).

? ? "*Turdampelis lanioides*, LESS. Echo du Monde Sav. 1844, 156" (Sclater).

? ? *Turdampelis rufococcyx*, LESS. Desc. Mam. et Ois. 1847, 324 (Sclater).

Hab. Brazil.

(No. 291*a*, Sclater Coll.) Wing rather longer than tail, which is moderately emarginated and still more graduated; the feathers broad. First quill about two-fifths the 2d, not quite one-third the longest (4th and 5th) 2d inter-

mediate between 6th and 7th; 3d between 5th and 6th, the feathers broad; the 1st primary slightly falcate, but not attenuated. Tarsi with two scutellar divisions only anteriorly at lower end, as in other *Myiadestes*, the upper indistinct.

Whole upper parts, with head all round, and upper part of breast, olivaceous-rufous (without any shade of green); lighter below, but brighter on throat; rest of under parts ashy; the flanks, lower breast, crissum, and tibia tinged with olive rufous. Tail like back; the central feathers and inner webs of the others with a purple tinge; the lateral paler on inner edge and at tip. Under wing coverts fulvous white: the basal portion of inner webs of quills (but not outer) pale cinnamon, fading off gradually along the edges of the quills, rest of these webs purplish-brown; whole of outer webs of quills like back, without any bars. Bill above black, beneath whitish; legs dusky.

(No. 291*a*.) Total length, 8.00; wing, 4.20; tail, 4.00, graduation, .34, emargination, .20; difference of 10th and longest quills, .91; exposed portion of 1st primary, 1.14, of 2d, 2.75, of longest (5th) (measured from exposed base of 1st primary), 3.20; length of bill from forehead, .70, from nostril, .35, along gape, .85; tarsus, .90; middle toe and claw, .86, claw alone, .26; hind toe and claw, .55, claw alone, .25.

This species is closely related in form to *Platycichla brevipes*, Baird, although the lower mandible is rather deeper and stouter, the upper less attenuated viewed from above. The first quill is longer, two-fifths the second instead of one-third, and not quite as much pointed; the tail is more graduated and emarginated; the feet much the same. The principal difference, therefore, is in the stouter lower mandible, and less attenuated bill, longer first primary, and more emarginate and graduated tail.

From *Myiadestes armillatus* it differs in stiffer tail and falcate acuminate outer primary. With such species, however, as *M. obscurus* and *venezuelensis*, it has very close relationships in form, so much indeed that it is very difficult to separate them generically; the tail feathers are perhaps broader and stiffer, and the bill rather longer and stronger; the wings and feet are precisely similar.

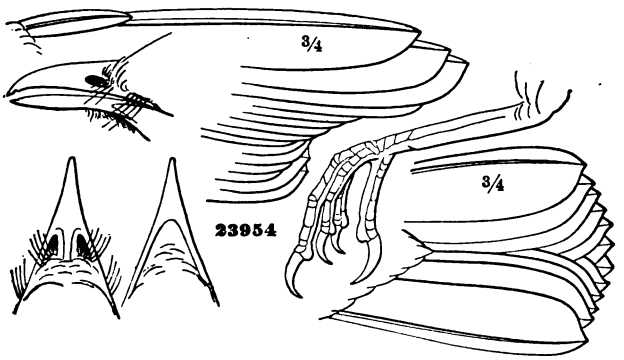
The two citations from Lesson, quoted in the synonymy, by Dr. Sclater, hardly appear to belong to this species, but rather to an allied one. The description in "*l'Echo*" I have not seen, that in "*Desc. des Mam. et Ois.*" shows many discrepancies.

For the opportunity of examining this species I am indebted to Dr. Sclater. I have seen a second specimen in the museum of the Philadelphia Academy.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
..	291*a*	..	Brazil.	...	Cab. Sclater.	.....

PLATYCICHLA, BAIRD.

Platycichla, BAIRD, Rev. Am. Birds, I, 1864, 32. (Type *P. brevipes*, BD.)



Platycichla brevipes, BAIRD. (Brazil.)

General appearance that of *Cichlopsis*, the bill rather longer and much more attenuated at the end; the lower mandible much weaker and narrower, the toes perhaps a little more deeply cleft; the feet larger, but similarly proportioned; the claws longer and less curved. The wings and tail are similar, the latter rather shorter; the outer quill one-third the 2d. Inside and bases of quills colored as in *Planesticus*, and throat similarly streaked.

This generic form in many respects, with *Cichlopsis*, unites the Thrushes to the *Myiadestes*, and shows clearly that all three should belong rather with the *Turdidæ* as a subfamily, than with *Ampelidæ*. I find no differences in any to throw them out of the *Turdidæ*, with which they agree so closely in the undivided tarsi (except occasionally at lower end), the short spurious primary, the toothed and bristled bill, etc.

For further remarks relative to this genus I refer to page 32 of the present work. I there placed it among the Thrushes, and now consider it as showing the relationship between the true *Turdinæ* and *Ampelinæ*, and proving the propriety of combining them in the same family.

Platycichla brevipes.

Platycichla brevipes, BAIRD, Rev. Am. Birds, I, 1864, 32 (Brazil).

Hab. Brazil.

For the description of this species I would refer to the page of the present work cited above.

FAMILY LANIIDÆ.

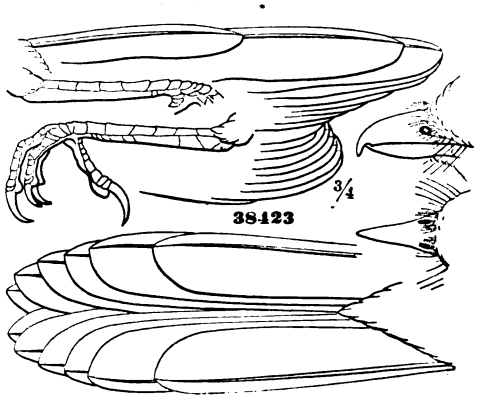
The diagnosis on page 322 will give a general idea of the characters of this family, as represented in the New World, especially as compared with its allies the *Vireonidæ* and *Ampelidæ*. The only genus found in America is that of typical "*Lanius*," and from which I have drawn the family characters, although as given above they are in general rather those of the *Laniinæ*.

Enneoctonus, of which Europe has several species, differs in much less rounded wing, the first quill about one-third the longest, the second about equal to the fourth; the tail shorter than the wing, and much less graduated; the bill more feeble. In the specimen before me of *Enneoctonus collurio* there is no indication whatever of division of lateral plate of tarsus, and the nostrils are scarcely concealed.

COLLURIO, VIGORS.

Collurio, VIGORS, Pr. Zool. Soc. 1831, 42. (Type *Lanius excubitor*, L.)
Lanius, AUT. (not of LINNÆUS, whose type is *L. cristatus*).
Collyrio, G. R. GRAY.—BAIRD, Birds N. Am. 1858, 323.

Body robust. Wings rather shorter than the much graduated tail (the lateral feather about three-fourths the central). Primaries ten; the 1st about half the 2d, which is longer than the 7th, the outermost slightly sinuated at end. Bill very powerful, deep and much compressed, both outlines much curved and convex; the upper mandible decurving into a strong hook with a deep notch behind it, followed by a prominent tooth; tip of lower bill obsoletely similar. Nostrils almost circular, placed nearly opposite middle of commissure, in nasal fossa, without membrane, excepting behind, overhung and mostly concealed by the stiff frontal bristly feathers and bristles; base of mouth also with prominent



Collurio excubitoroides.
(All the figures three-fourths natural size.)

bristles. Feet strong and well developed; the tarsi longer than middle toe and claw, with seven or eight scutellæ anteriorly, the lateral plates usually with a tendency to subdivision inferiorly, especially the outer, which is sometimes divided regularly its entire length in *C. excubitoroides*, although this character is not the same even on opposite feet of the same specimen. Lateral toes nearly equal, reaching about to base of middle claw; the toes quite deeply cleft, the inner nearly to its base, but adherent to half the basal joint of middle; externally this joint is united nearly throughout to one and a half joints of outer toe; these basal joints somewhat abbreviated, so that the inner is rather longer than middle.

There is a slight variation in form in American species of *Collurio*, the legs being shorter and the bill longer proportionally in *borealis* than in the others. In *excubitoroides* the legs are longer both absolutely and relatively than in any American species, or *C. excubitor* of Europe. There is much difference in specimens, and even in different feet of the same specimen in regard to the subdivision of the lateral plates (especially the outer) of tarsus, this sometimes being quite regular, as much so as anteriorly, at other times quite the contrary; frequently the plates are entire, except at the lower end.

The type of the genus *Lanius*, as established by Linnæus in the 10th edition of Systema Naturæ, is the *L. cristatus* of India and Java, which, according to Cabanis, is congeneric with the *L. collurio*, the type of Boie's genus *Enneoctonus*. *Lanius* should, therefore, replace *Enneoctonus* for the long-winged European Shrikes, and another name adopted for the larger European and American forms. In the "Birds of North America," 1858, I used the name *Collyrio* of Mœhring for this group, following G. R. Gray, but as I now admit no genera of authors prior to or contemporaneous with Linnæus, who did not adopt the binomial system, as established by him, not even those of Linnæus himself prior to 1758, it becomes necessary to take the next in order, namely, *Collurio* of Vigors.

The following synopsis will exhibit the characters of the North American Shrikes, as well as of their close ally, *C. excubitor* of Europe:—

GENERAL COLOR.—Bluish or plumbeous-ash above; the outer edges of scapulars, sometimes the forehead and rump, paler. Beneath white, sometimes with waved transverse dark lines. A broad black stripe from side of upper bill through eye (extending more widely beneath than above it, sometimes wanting above) to end of ear coverts. Wings (except lesser coverts) and tail black; the former with a white patch across base of primaries (sometimes on inner webs of secondaries); the secondaries tipped with white; the tail with broad white tips to the lateral feathers, the concealed bases of which are also usually white.

A. Black cheek-stripes involving eyelid only on upper border of eye, and not meeting across the forehead. A crescentic patch of white in the black, below the eye; upper edge of black stripe behind the eye bordered by hoary whitish. Breast and belly always with distinct, transverse waved lines of dusky. Bill, when mature, entirely black. Length about 10 inches.

Above light ash. Upper tail coverts and forehead much paler than the back, the former without waved lines. Axillars whitish.

Inner webs of secondaries paler towards edges, but not of well-defined white. Concealed bases of tail feathers, except sixth, white. Tarsus shorter than the gape of mouth . *borealis.*

B. Black cheek-stripes not involving upper border of eye or upper eyelid, which is whitish, and not meeting across the forehead, its upper edge behind the eye with scarcely a lighter border. No patch of white on lower eyelid. Under parts unvaried white; in female obscurely waved. Base of under mandible whitish. Length about 9 inches.

Above light ash. Upper tail coverts and forehead decidedly paler than the back. Axillars whitish.

Inner webs of all secondaries (except innermost) white to shaft, except for less than terminal half, which is black along the shaft. Concealed base of tail white, except on sixth feather. Tarsus equal to the gape . . *excubitor*

C. Black cheek-stripes involving upper eyelid, as in A, but without patch of white below the eye; meeting in a narrow, sometimes inconspicuous line across the forehead, its upper edge behind the eye not bordered by lighter. Beneath plain white, or very obscurely waved in *ludovicianus* (the female?). Bill, when mature, entirely black. Length about 8.50 inches.

Above dark plumbeous-ash. Upper tail coverts and forehead scarcely paler than the back. Sides and breast tinged with bluish-gray.

Black of loral space rather hoary along upper border. Frontal dark line inappreciable or wanting. Inner webs of secondaries paler only along the marginal half, and not abruptly white. Axillars plumbeous. Tail feathers, except the innermost, with a concealed well-defined white patch at base, largest on the more exterior one. Bill from nostril, .50. Under parts often with very obscure faint waved lines (in the female?). White patch on wing reaching about to middle of 1st primary. Tarsus equal to the gape . . . . . *ludovicianus.*

Black of loral space without any lightening above it. Frontal black band well marked. Inner webs of secondaries (except innermost) pure white to shaft, except along rather more than terminal half, where the shaft is bordered by black. Axillars whitish. Tail feathers black to base, except the loose fibres, which are grayish. Bill from nostril, .60. Under parts without waved lines. White patch on wing reaching nearly opposite to end of 1st primary. Tarsus about equal to the gape . *elegans.*

Above light ash color. Upper tail coverts and forehead much lighter than the back, the former sometimes almost white. Sides and breast generally nearly pure white.

Black of loral space with conspicuous hoary margin above it. Inner web of secondaries much as in *C. ludovicianus.* Axillars whitish. Tail feathers with concealed white patch at bases of all the feathers. Bill from nostril, about .50. No waved lines beneath. White patch on wing reaching nearly opposite to end of 1st primary. Tarsus longer than the gape . . . . . *excubitoroides.*

Collurio borealis.

Lanius borealis, VIEILLOT, Ois. Am. Sept. I, 1807, 90, pl. 1.—Sw. F. B. A. II, 1831, 111.—AUD. Syn. 1839, 157.—IB. Birds Am. IV, 1842, 130, pl. 236.—CASSIN, Pr. A. N. Sc. 1857, 212.—MAX. Cab. Jour. VI, 1858, 190 (Upper Missouri).—JONES, Nat. Bermuda, 1857, 51 (Bermuda).—*Collyrio borealis*, BAIRD, Birds N. Am. 1858, 324.—COOPER & SUCKLEY, P. R. Rep. XII, II, 1860, 188 (Washington Territory).

Lanius excubitor, FORSTER, Phil. Trans. LXII, 1772, 382 (not of LINNÆUS).—WILSON, I, 1808, 74, pl. v, fig. 1.

Lanius septentrionalis, BON. Syn. 1828, 72 (not of GMELIN, which cannot be identified as an American species).—IB. Rev. et Mag. Zool. 1853, 294.—CASSIN, Pr. A. N. Sc. 1857, 213.—MURRAY, Ed. New Phil. Jour. XI, 1859, 223 (H. B. T.).

Hab. Whole of America north of United States; in winter south to Washington, St. Louis, Prescott (Ariz.), and north California.

(No. 19,545, ♂, in full spring plumage.) Fourth quill longest; 3d and 5th little shorter; 2d shorter than 6th; exposed portion of 1st not quite half that of longest.

Whole upper parts pure clear light ash; beneath (including axillars) pure white, the breast and upper part of belly waved transversely with [illegible] narrow dusky lines (about .15 of an inch [illegible] each feather or three, which are curved, convex, and [illegible] one some- the tip. Bristly feathers covering the [illegible] the feet

base of upper mandible to gape, black; this color extending as a broad stripe through the eye, and behind it to nape, involving the ear coverts, and forming a conspicuous and continuously deep black stripe, excepting a few white feathers on lower eyelid (sometimes a well-marked crescentic spot), and an almost inappreciable lightening among the loral feathers, the black of opposite sides, however, not meeting on the forehead as in *L. excubitoroides*. The black involves only the upper eyelid, but is quite broad below the eye. The forehead and space above the black stripe, almost to its posterior extremity, are hoary white, shading into the ash of crown; the rump and ends of scapular feathers are similarly colored, though perhaps less purely white; the ends of upper tail coverts becoming also more ashy. Wings and tail black, the tips of the secondaries and the bases of the primaries white, this increasing in amount on the latter from the outermost, and showing externally as a white patch (but hardly appreciable, especially on outer webs in first and second). Secondary quills whitish along inner edge, and full half of the inner web tinged with grayish, but without abrupt definition. Outer tail feather, with basal half of inner web, and a narrow stripe in the outer web along the shaft, as well as the shaft itself nearly to end, black; the black advancing more and more in the other feathers till on the 4th there is only a narrow tip of white; the 5th and 6th entirely black; all the feathers with small basal white patch, except on inner web of 6th. Bill and feet pure black.

Female birds in the breeding season are much duller than the males, the ash of upper parts much tinged with ochrey brown, the black stripe through the eye more or less obsolete, the white of wing much less conspicuous.

(No. 19,545, ♂.) Fresh specimen: Total length, 10.00; expanse of wings, 14.50; wing from carpal joint, 4.70. Prepared specimen: Total length, 10.00; wing, 4.50; tail, 4.70; exposed portion of 1st primary, 1.65, of 2d, 2.90, of longest (measured from exposed base of 1st primary), 3.40; length of bill from forehead, .85, from nostril, .60, along gape, 1.05; tarsus, 1.05; middle toe and claw, .88, claw alone, .33; hind toe and claw, .63, claw alone, .35.

The plumage of the male, in the breeding season, as indicated above, has not been before described. As met with during its more winter abode in the United States, *C. borealis* is duller in plumage, and though sometimes quite pure ashy, always has a tinge of brownish; and the stripe on the side of the head is only well defined behind the eye. There is generally a better marked clear white crescentic spot below the eye, and a blackish spot anterior to its upper half; the feathers along the base of upper mandible, from nostrils to gape, are black; but the rest of the pre-ocular region is grayish, clouded somewhat by the blackish bristly points and shafts of some of the feathers. The bill, instead of being pure black, is much paler, and almost whitish at the base, especially of lower mandible. The dark lines below are more distinct, and extend more on the throat, as well as along the sides.

Other specimens of females, or immature males probably, are

still more different: the more distinct dark transverse waved lines extend over the whole under surface from chin, except about the anal region; the upper parts almost continuously ochrey brown; the black eye stripe indicated only by rather dusky ears; the white at base of primaries nearly or entirely wanting; the white at end of tail feathers more restricted. Every grade of coloration between these extremes is to be met with.

As usual in American birds, the more boreal specimens are decidedly the larger. The species probably does not breed within the limits of the United States, except possibly in the northern portions of the mountain regions; but in winter it is found over the entire breadth of the country to quite a southern latitude.

Lanius major, PALLAS, Zoog. Rosso-As. I, 1831, 401, and KEYSERLING & BLASIUS, Wirb. Europas, I, 1840, lx, and 193, from Northeastern Europe and Siberia, judging from the description, appears to resemble *borealis* in size and other characters; the dark inner webs of the secondaries; the diminished amount of black anterior to the eye; the whitish rump, and the waved lines of the under parts, as well as in having the tarsus shorter than the gape. The rump, however, is said to be waved transversely with dusky, and the eyelids to be white, as in *excubitor*, not black.

The differences in color of *C. borealis* from *ludovicianus* and *excubitoroides* are shown in the preliminary diagnoses. The bird is stouter in form, with proportionally longer bill, and decidedly shorter tarsi. The tarsi are considerably shorter than those of *excubitoroides*.

Specimens examined, fifty-three. The more important localities are the following:—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
19,545	394	♂	Fort Resolution, Great Slave Lake.	April 24, '60.	R. Kennicott.	.....
27,317	1,342	..	Fort Simpson.	...	B. R. Ross.	.....
27,319	1,621	..	Ft. Peel's River.	...	R. Kennicott.	.....
27,311	962	..	Fort Youkon.	Sept. 24, '60.	"	.....
27,312	173	♀	"	June 27.	Jas. Lockhart.	.....
31,450	164	..	Fort Rae.	June 10, '63.	L. Clark.	.....
19,551	39	..	Fort Liard.	April 2, '60.	B. R. Ross.	.....
32,345	..	..	Moose Factory.	...	J. Mackenzie.	.....
23,256	..	..	New Brunswick.	...	G. A. Boardman.	.....
17,192	..	..	Halifax, N. S.	...	W. G. Winton.	.....
907	..	..	Carlisle, Pa.	Nov. 1842	S. F. Baird.	.....
12,501	..	♀	Washington, D. C.	Feb. 10, '46.	R. J. Pollard.	.....
7,196	27	..	Shoalwater Bay, W.	Nov. 1854.	Dr. J. G. Cooper.	.....
16,169	..	♀	Fort Crook, Cal. [T.	...	J. Feilner.	.....
18,329	..	♂	Hellgate, Montana.	...	Lt Mullan.	Jno. Pearsall.
11,061	..	♂	Fort Bridger.	April 16.	C. Drexler.	.....
39,369	1,152	..	Fort Whipple, Ar.	Feb. 6, '65.	Dr. E. Coues.	.....

(27,312.) With eggs. (707.) 9.80; 14.50; 4.50. [illegible] 14.80.

Collurio ludovicianus.

Lanius ludovicianus, LINN. Syst. Nat. 1766, 134 (based on *Lanius ludovicianus*, BRISSON, II, 102, tab. xv, fig. 2).—AUD. Orn. Biog. I, 1831, 300, pl. 37.—IB. Birds Am. IV, pl. 237.—CASSIN, Pr. A. N. Sc. 1857, 213.—*Collyrio ludovicianus*, BAIRD, Birds N. Am. 1858, 325.

Lanius ardosiaceus, VIEILLOT, Ois. Am. Sept. I, 1807, 81, pl. li.

Lanius carolinensis, WILS. Am. Orn. III, 1811, 57, pl. xxii, fig. 5.

Hab. South Atlantic (and Gulf?) States.

(No. 3,054.) Fourth quill longest; 3d, and then 5th little shorter; 2d intermediate between 6th and 7th; 1st about half the longest.

Upper parts rather dark plumbeous-ash, almost inappreciably paler on the upper tail coverts; beneath dull bluish-white, the sides of body pale plumbeous, shading insensibly into the whitish of belly; the axillars, for the most part, almost as dark plumbeous as the back, the outer webs of those nearest the wing whitish (the inner wing coverts dark plumbeous, edged with dusky). In the specimen described (perhaps female) the feathers of jugulum and breast present very obsolete and indistinct waved transverse lines of pale plumbeous, and some of the upper tail coverts are tipped with blackish. Bristly feathers at side of upper mandible continuous with a broad stripe through and behind the eye to posterior extremity of ear coverts, black. This stripe extends narrowly above and broadly below the eye, and is not varied on lower eyelid with white. There is no black frontal line, although the black frontal bristles of opposite sides sometimes almost meet. Forehead and side of crown as far as the eyes somewhat hoary, shading into the ash of the head. Outer webs of scapular feathers also whitish, shading into the color of back. Wings black; the lesser coverts only like the back; the tips of secondaries, and a distinct patch at base of primaries, white. This patch crosses the bases of all the primaries (indistinct on the outer), extending farthest along the middle ones, where it reaches a point but little beyond the middle of the exposed portion of the outer primary. The inner webs of the secondaries are gray or whitish for about half way from the border to the shaft, but not abruptly defined. The tail is black; the concealed bases of all the feathers, except perhaps the innermost, are white; the entire terminal third of the outer feather, and still more of its outer web, with a constantly decreasing amount on the succeeding feathers as far as the fourth, white; the shafts, however, are dusky almost to their extremities. Bill and feet black.

(No. 3,054.) Total length, 8.50; wing, 3.72; tail, 4.10, its graduation, .92; exposed portion of 1st primary, 1.76, of 2d, 2.40, of longest (measured from exposed base of 1st primary), 2.75; length of bill from forehead, .82, from nostril, .50, along gape, .98, depth, .36; tarsus, 1.00; middle toe and claw, .82, claw alone, .30; hind toe and claw, .65, claw alone, .32.

Of the ten specimens before me nearly all exhibit, to a greater or less extent, the obsolete wavings on the feathers, described above. In several, also, the lesser wing- and upper tail-coverts are tipped occasionally with blackish—features not observed in *excubitoroides*. There is some variation in amount of white on the tail in No. 542,

this involving more than half of the outer feather, or nearly the whole of its exposed portion.

Young birds differ in having the upper plumage much duller and tinged with ochraceous; the feathers, especially of head and rump, waved (most finely on the head) with dusky, the jugulum and breast similarly marked. The tips of the greater wing coverts are pale ochraceous, and, like the lesser, are waved with dusky; the black cheek stripe is obsolete in front of the eye, excepting a spot at its anterior canthus; the bill and legs are paler.

The difference between this species and its American allies will be pointed out farther on. It appears to be very closely related to the *L. meridionalis* of Europe (TEMMINCK, Man. I, 1820, 143; DEGLAND, Ois. Eur. I, 1849, 384; BREE, Birds Europe, I, 1859, 159, plate, etc.); but judging from Degland's description, the latter differs principally in the vinaceous or rosy tinge of the under parts, and in the rectrices being entirely black at the base. The eye stripe, with its paler upper border anteriorly, and the white markings of the wing appear to be much the same. The length of *meridionalis* (ten inches) is considerably greater.

Specimens examined, ten.

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
3,054	..	..	Liberty County, Ga.	1846.	S. F. Baird.	.....
542	..	..	Southern Atlantic States.	...	"	.....
2,420	..	Juv.	Savannah, Ga.	1845.	"	.....

Collurio elegans.

Lanius elegans, SW. F. B. A. II, 1831, 122.—NUTTALL, Man. I, 1840, 287.—CASSIN, Pr. A. N. Sc. 1857, 213.—BAIRD, Birds N. Am. 1858, 327.—*Collyrio elegans*, BAIRD, Birds N. Am. 1858, xxxv.

Hab. California?

Third quill longest; then 4th and 5th; 2d between 5th and 6th; 1st about half the longest. Bill lengthened and very powerful, as large and strong as that of *L. borealis*.

Upper parts dark plumbeous-ash (very much as in *L. ludovicianus*); darkest on head, a little paler perhaps on the lower back and rump (very slightly and almost inappreciably, however); the forehead as d[illegible] as, or even darker than the vertex; the longer scapulars quite white at [illegible] beneath bluish-w[illegible] quite pure on throat and sides of neck, midd[illegible] and crissu[illegible] sides of body and the front of breast decided[illegible] he axillar[illegible] ever, with their outer webs quite white, thei[illegible] ashy; t[illegible]

coverts gray. Wings and tail black, varied with white; the former showing externally a large white patch at bases of primaries, and broad white tips to the secondaries. The white on primaries extends nearly as far as the tip of the 1st quill; the inner webs of the secondaries (excepting the innermost ones) are pure white to the shaft for their basal half, the posterior border of the patch perpendicular to the shaft; this color also bordering the web for half its width to the end, and quite abruptly defined. The tail feathers are apparently without any concealed white at their bases, although the disconnected fibres are grayish; the outer feather has the terminal third and all the outer web white; the amount of white diminishes in the 2d, 3d, and 4th feathers; the 5th and 6th entirely black.

There is a broad black band from bill through and behind eye, and unvaried by white, as in *excubitoroides*, and with a well defined narrow frontal line of the same color; the loral region, however, exhibits a tinge of deep ashy; the bill and legs are black.

Total length, 8.75; wing, 4.20; tail, 4.40, graduation, 1.00; exposed portion of 1st primary, 1.35, of 2d, 2.60, of longest (measured from exposed base of 1st primary), 2.95; length of bill from forehead, 1.00, from nostril, .59, along gape, 1.10, depth, .39; tarsus, 1.20; middle toe and claw, .95, claw alone, .34; hind toe and claw, .70, claw alone, 33.

The description given above is taken from a specimen in the collection of the Philadelphia Academy, labelled as having been collected in California by Dr. Gambel, and is very decidedly different from any of the recognized North American species. Of nearly the size of *C. excubitoroides* and *ludovicianus*, it has a bill even more powerful than that of *C. borealis*. In its unwaved under parts and uniform color of the entire upper surface, except scapulars, it differs from *borealis* and *excubitoroides*, and resembles *ludovicianus*. In the extension of white over the inner webs of the secondaries, it closely resembles *C. excubitor*. The great restriction of white at the base of the tail—the four central feathers being entirely black, and the bases of the others grayish-ashy—is quite peculiar to the species.

I am by no means satisfied that the bird here described is the true *Lanius elegans* of Swainson—there being several marked differences from his description. In the essential features, however, of the larger size, especially of the bill, the concolored forehead, the scarcely lighter rump, and the greater amount of white on the inner webs of the secondaries, there is a decided accordance. In Swainson's bird the tail seems to be almost as white as in extremes of coloration of *excubitoroides*, instead of being much blacker than usual.

Collurio excubitoroides.

Lanius excubitoroides, Swainson, F. B. A. II, 1831, 115 (Saskatchewan). —Gambel, Pr. A. N. Sc. 1847, 200 (Cala.).—Cassin, Pr. A. N. Sc.

1857, 213.—SCLATER, P. Z. S. 1864, 173 (City of Mexico).—*Collyrio excubitoroides*, BAIRD, Birds N. Am. 1858, 327.

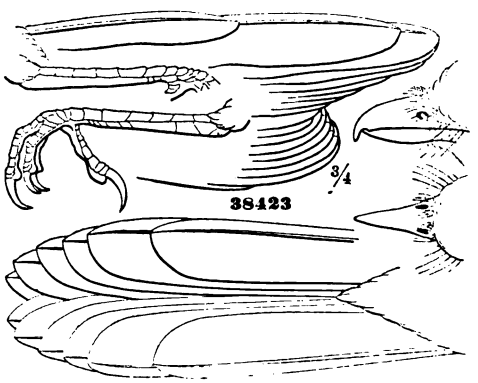
? *Lanius mexicanus*, BREHM. Cab. Jour. II, 1854, 145.—SCLATER, Catal. 1861, 46 (Mexico).

Lanius ludovicianus, MAX. Cab. Jour. 1858, 191 (Upper Missouri).

Hab. Western province of North America, as far north as California; Middle North America, to the Saskatchewan, and east to Wisconsin, Michigan and Illinois; south to Orizaba and Oaxaca, and City of Mexico; Cape St. Lucas.

(No. 38,423 ♀ ♂; Laramie Peak.) Graduation of tail rather less than one-fourth of its total length. Fourth quill longest; 3d scarcely shorter; then the 5th; 2d longer than 6th; exposed portion of 1st about half that of longest.

Above pure light bluish-ash; beneath, including axillars, pure unbroken white. A very narrow frontal line with all the nasal feathers, and continuous with a broad stripe through and behind eye, involving entire ear coverts, with the wings and tail, bill and feet, deep black (the lesser wing coverts, however, like the back); the cheek stripe extending narrowly above the eye and broadly below it, and not varied with white on the lower eyelid. The forehead and side of vertex in contact with the black stripe, as far as posterior border of eye, hoary, almost pure white, shading off quite abruptly into the ash of head; the scapular feathers, where they overlap the wings, as well as upper tail coverts, similarly white, and shading into the adjacent ash; the coverts, however, slightly glossed with ashy, especially above. The tips of the secondary quills, and a conspicuous patch across the base of the primaries (visible externally in the closed wing) are white; this involves both webs of the primaries (except perhaps the 1st), and extends about as far as the tip of the 1st primary, occupying more and more space from the outer to the middle quills. The secondaries are edged internally, as well as tipped with white; this color usually mixed with grayish, occupying rather the larger portion of the web towards the base, but not abruptly defined as in the primaries, and only reaching the shaft at the extreme base, and that obliquely. Outer two tail feathers entirely white, except a wash of dusky along the shaft (greatest in extent on the 2d feather); the 3d feather is white with rather more than the central third black; the fourth feather is black, with the extreme base and



Collyrio excubitoroides, BAIRD. (Laramie Peak.)
(All the figures three-fourths natural size.)

tip only white, the rest are entirely black, except their concealed bases, which in all the feathers are white.

(No. 38,423.) Total length, 8.50; wing, 4.05; tail, 4.25, its graduation, 1.00; exposed portion of 1st primary, 1.50, of 2d, 2.60, of longest (measured from exposed base of 1st primary), 2.95; length of bill from forehead, .83, from nostril, .48, along gape, .95, depth, .33; tarsus, 1.12; middle toe and claw, .77, claw alone, .28; hind toe and claw, .64, claw alone, .32.

Young birds are marked very much as those of *C. ludovicianus*, already described. There does not seem to be much difference in color between the sexes. Winter specimens appear inclined to a reddish tinge and obscure waves of dusky.

The specimen described (No. 38,423) presents an extreme amount of white on the wings and tail. More frequently there is a rectangular patch of black on the inner web of outer tail feather (usually at distal end of basal half), and generally visible at the tips of under tail coverts, which becomes larger and larger in the next two feathers; the fourth, and sometimes fifth, with a narrow tip only of white. Scarcely any two specimens, however, agree exactly in this amount of black; in all, the extreme bases of the quills are white, excepting the innermost, which usually are black, unless when the white on the ends of the lateral tail feathers is of more than usual extent.

In No. 38,420 the white of inner webs of secondaries is purer, and on the more exterior reaches to the shaft on the basal third, then passing off obliquely behind to the inner edge of the quill, not transversely. The other characters are much as described. This amount of white on the secondaries is, however, but seldom met with.

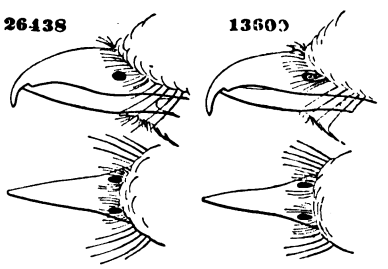
No. 5,066, from Donaña, N M., has the hoary front so light as to appear in very abrupt contrast against the dusky stripe through the eye.

In No. 8,721, from near San Francisco, the colors are much darker than as described, the plumbeous of upper parts being as dark as in *ludovicianus*, and without any hoariness on forehead and side of vertex; more as in *elegans*.

In general, specimens from the California coast are considerably darker than those from the Plains, very similar in color to *C. ludovicianus;* the hoariness of forehead greatly reduced, sometimes scarcely appreciable. The sides and axillars are more plumbeous; less, however, than in *ludovicianus*, and the upper tail coverts are always considerably and appreciably lighter than the back.

Cape St. Lucas specimens are rather darker, especially on the

head, than those from the Rocky Mountains; and among them are several with unusually large bills, almost as large as that of *C. elegans*, one of which (No. 26,438) measures .95 from forehead, .55 from nostril, and 1.05 from gape, which generally exceeds the average. The other characters, however, are essentially those of *excubitoroides*. In nearly the whole series (all autumnal birds) there is a decided tinge of reddish on breast and sides, which also are obscurely undulated with dusky.



Specimens from the Mississippi Valley, east of the river, are darker, with the white markings less prominent, and with a general approximation to the characters of *C. ludovicianus*. They, are, however, usually paler than the California birds. Mexican specimens are perhaps more like those just referred to, and less typical, although some are true and well-marked *excubitoroides*. One of these Mexican skins (No. 13,600) has an unusually slender and deeply hooked bill. (See figure above.)

In this species (?), as in *C. ludovicianus*, there is so much variation in the amount of white on the tail, as well as in the comparative length of the feathers, as to unfit these features for specific indication, except as a general average.

This Shrike, in its extreme stage of coloration, differs from *ludovicianus* in paler and purer color; the ash of back lighter; the under parts brilliant white, not decidedly plumbeous on the sides as in the other, and without so great a tendency to the usual obsolete waved lines (noticed distinctly only in winter or immature birds); the axillars bluish-white, not plumbeous. The white of wings and tail is more extended; the hoary of forehead and whitish of scapulars more distinct. The bristles at base of bill somewhat involving the feathers are black, forming a narrow frontal line, not seen in the other. The most striking difference is in the rump and upper tail coverts, which are always appreciably and abruptly lighter than the back, sometimes white or only faintly glossed with plumbeous; while in typical specimens of *ludovicianus* these feathers are scarcely lighter at all, and generally more or less varied with blackish spots at the end. The legs and tail are apparently longer, the latter less

graduated. These differences are, however, most appreciable in specimens from the middle and western provinces Those from the Western States, east of the Missouri River, as far north as Wisconsin, are more intermediate between the two, although still nearest to the Rocky Mountain bird as described; the back darker, the rump and axillars more plumbeous, the sides more bluish. I have little doubt that the examination of series from the States along the Mississippi will show a still closer resemblance to typical *C ludovicianus*, and that the gradation between the two extremes will be found to be continuous and unbroken. It therefore becomes a question whether there is really more than one species, varying with longitude and region, according to the usual law, the more western the lighter, with longer tail; or whether two species, originally distinct, have hybridized along the line of junction of their respective provinces, as is certainly sometimes the case. The approximation in many respects of coloration of the Shrikes of the Pacific coast to those of the South Atlantic States, is not without its importance in the discussion of the subject. Pending the decision of this question, however, I propose to retain the name of *excubitoroides*, as representing, whether as species or variety, a peculiar regional form, which must be kept distinctly in mind. The comparatively greater size of the bill in the Cape St. Lucas specimens is seen in other species from this locality.

The intensity of the black front in this species varies considerably, sometimes very distinct, and again entirely wanting. This may probably be a character of the breeding season, the dulness of black anterior to the eye, and the lighter color of the bill, having a close relationship here, as in other species, to maturity, sex, and season.

The essential differences between this species and the *C. excubitor*, of Europe, will be found in the diagnosis given under the generic head. They are quite appreciable on a slight comparison.

Specimens examined, over one hundred in number. The more important localities are the following:—

Smithsonian No.	Collector's No.	Sex and Age.	Locality.	When Collected.	Received from	Collected by
5,504	655	♂	Petaluma, Cal.	April, 1856.	E. Samuels.	.....
5,505	743	♀	" [cisco.	May, 1856.	"	.....
8,721	..	..	Presidio, San Fran-	...	Lt. Trowbridge.	.....
39,483	..	..	San Francisco.	1865.	Col. C. S. Bulkley.	E. T. Lorquin.
5,947	..	..	Santa Clara, Cal.	...	Dr. J. G. Cooper.	.....
4,940	..	..	San Jose, Cal.	...	A. J. Grayson.	.....
8,719	..	..	Tulare Valley.	...	Lt. Williamson.	Dr. Heermann.
			Fort Tejon.	...	J. Xantus.	.....
18,330	762	♂	Fort Benton, Id.	1860.	Lt. Mullan.	J. Pearsall.
13,302	..	♀	SteptoeValley,Utah.	Mar. 12, '59.	Capt. J. H. Simp-	C. S. M'Carthy.
38,420	..	..	Fort Laramie.	1864.	Dr. Hitz. [son.	.....
38,423	49	..	Laramie Peak.	May, 1864.	"	.....
35,403	1,729	..	Colorado Terr.	...	Chicago Ac. Sc.	D. Thompson.
5,066	..	..	Donaña, N. M.	Nov. 14, '55.	Capt. J. Pope.	.....
37,005	706	..	Fort Whipple, Ar.	Sept. 8, '64	Dr. E. Coues.	.....
26,438	1,732	..	Cape St. Lucas.	1859.	J. Xantus.	.....
26,437	..	..	"(San Nicolas).	Oct. 1859.	"	.....
40,530	362	..	Fort Rice, Dac.	1865.	Gen. A. Sully.	S. M. Rothham-
8,722	..	Juv.	Racine, Wis.	1853.	S. F. Baird.	..... [mer
35,032	..	..	Chicago, Ill.	June, 1864.	Chicago Ac. Sc.	.....
10,172	..	♂	Marion County, Ill.	...	R. Kennicott.	.....
34,558	..	♂	Mt. Carroll, Ill.	May 28, '64.	H. Shimer.	.....
26,012	25	..	Winnebago, Ill.	July, 1862.	J. W. Tolman.	.....
12,504	..	..	Red Fork of Arkan-	...	Dr. Woodhouse.	.....
1,664	..	Juv.	Michigan. [sas.	...	S. S. Haldeman.	.....
29,360	140	..	Colima, Mex.	Feb. 1863.	J. Xantus.	.....
4,190	..	..	Charco Escondido,	Mar. 1863.	Lt. Couch.	.....
13,600	..	..	Mexico. [Mex.	...	J. Gould.	J. Taylor.
33,573	162	♂	Mirador, Mt. Ori-	Feb. 1864.	Dr. Sartorius.	.....
29,694	..	♀	Oaxaca. [zaba.	Nov. 1860.	A. Sallé.	.....

(37,005.) 9.00; 12.60. (26,012.) With eggs.

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[1] By mistake named *fulvigula*, on p. 318.

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THE

CONSTANTS OF NATURE.

PART I.

SPECIFIC GRAVITIES; BOILING AND MELTING POINTS; AND CHEMICAL FORMULA.

COMPILED BY

FRANK WIGGLESWORTH CLARKE, S.B.

WASHINGTON, D.C.
PUBLISHED BY THE SMITHSONIAN INSTITUTION.
DECEMBER, 1873.

ADVERTISEMENT.

THE Smithsonian Institution has long had in contemplation the publication of a series of "Constants of Nature," and has accepted the following work as the first part of such a series. Other parts will be published in succession as soon as the matter for them may be obtained and the finances of the Institution will warrant.

The present work was referred for critical examination to Professors Joy and Chandler of Columbia College, New York, and has been published on their recommendation.

JOSEPH HENRY,

Secretary S. I.

WASHINGTON, D. C., December, 1873.

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INTRODUCTION.

About two years ago, while engaged upon the study of some interesting points in theoretical chemistry, the compiler of the following tables had occasion to make frequent reference to the then existing lists of specific gravities. None of these, however, were complete enough for his purposes. Böttger's work was too old, and not suitably arranged; and the tables published in the various larger treatises on chemistry were lamentably small. Accordingly he prepared a set of Specific Gravity Tables for his own private use, without view toward publication. The material proved abundant; revisions and re-revisions became necessary, and, finally, it seemed to the writer advisable to complete and publish the tables. And in the final revision the boiling and melting points, and the references to original papers were added.

Of course, having grown out of the individual needs of the compiler, the character of the tables has been shaped by the nature of the work upon which he was at first engaged. It was necessary for him to compare the specific gravities of similar compounds of the same elements, and to arrange them in series. In consequence it will be found, on reference to those portions of the tables containing organic compounds, that no rigid theoretical arrangement could well be followed. It would be very well, doubtless, to be able to compare at a glance the properties of ethyl and all its compounds, or of benzol and all its derivatives. But such an arrangement would necessitate the comparison of hydro-carbons with oxygenated, chlorinated, nitrogenous, or organo-metallic bodies; or, in other words, the comparison

of compounds built up of dissimilar elements; this, however, was not the writer's purpose. And a glance at the tables will show that the arrangement is essentially different. All the hydro-carbons are placed together, arranged, as far as possible, in regular series, with reference to their chemical relations. So also all compounds containing carbon, hydrogen, and oxygen, united together without the presence of other elements, and so on. The Table of Contents will doubtless prove a sufficient key to the arrangement.

That the tables are absolutely complete, is not claimed for them, especially as their scope is limited. They contain no determinations of specific gravity for solutions, and all such must be sought for in Storer's "Dictionary of Solubilities." And they contain but few determinations of natural minerals, most of the silicates, especially, being omitted. Again, numerous old determinations of specific gravity are left out, as having been rendered utterly valueless and supplanted by more recent and more accurate observations. In short, all that is claimed for the work is, that it forms a practically complete table of the specific gravities of *artificial compounds of definite constitution*: all else in the table is gratuitous. There are some determinations of specific gravities of natural minerals, chiefly those of comparatively simple composition, quite full sets of observations for most of the chemical elements, and a good number of determinations for the leading alloys. So with the boiling points and melting points; they have been added merely to supplement the specific gravities: but as far as the table claims thoroughness, it will be found complete. Up to June 1, 1871, little has been omitted, except in the cases mentioned above.

There is one obvious objection to the method of arranging determinations of physical constants in tables. Details cannot be given. In many cases there are important questions of detail to be considered. How was a determination made? How was the material obtained? And if several isomers are grouped under one name—as for instance the several butyl alcohols, or the isomeric bodies known as cumol—which one is meant when a specific gravity is given? All these ques-

tions cannot be easily answered in a table of this sort. In order to relieve this difficulty, the references to original papers have been supplied. Almost every determination in the tables is accompanied by such a reference. Some of these, indeed, are not direct references to the paper of the investigator, but to the "Jahresbericht," by means of which, however, the paper itself can be found. Some determinations, nevertheless, lack such references. They were among those which formed the first table, compiled for private use, and which I have not been able since to trace back to their sources.

In conclusion, a brief statement of the extent of the work here presented may be desirable. The table, exclusive of its supplement, contains the specific gravities of 2263 substances, and over 5000 determinations in all. There are over 2000 determinations of boiling point, representing 1205 different substances; and nearly 500 of melting point, for 326 different substances. In all, the names of 2572 distinct bodies will be found in the table. The work may contain errors—especially errors of judgment in arranging the material—but the writer hopes that these are few in number. And he feels sure that all who have experienced the difficulties of preparing such work for the press, will readily pardon the mistakes which may have occurred.

F. W. C.

Boston, April 14th, 1872.

A LIST

OF THE MORE IMPORTANT OF THE PAPERS USED IN COMPILING THE FOLLOWING TABLES.

I. Papers upon Atomic Volume and Specific Gravity.

1. W. Herapath.—"Contributions to our knowledge of chemical bodies." Phil. Mag. 64. (1824). 321.
2. Boullay.—"Dissertation sur les modifications que subit le volume des corps solides dans les combinaisons chimiques." Ann. Chim. Phys. (2). 43. (1830). 266. Poggend. Annal. 19. 107.
3. Karsten.—"Verhältniss chemischer Mischung zur Form." Schweig. Journ. 65. (1832). Two papers; pages 320, 394.
4. Kopp.—"Ueber das Volumenometer, ein Instrument zur Bestimmung des Volums fester oder flüssiger Körper." Ann. Chem. Pharm. 35. 17.
5. Kopp.—"Ueber Atomvolum, Isomorphismus, und specifisches Gewicht." Ann. Chem. Pharm. 36. (1840). 1. Ann. Chim. Phys. (2). 75. 406.
6. Kopp.—"Ueber die Vorausbestimmung einiger physikalischen Eigenschaften bei mehreren Reihen organischer Verbindungen." Ann. Chem. Pharm. 41. (1842). Two papers; pages 79, 169.
7. Kopp.—"Recherches sur le volume spécifique." Ann. Chim. Phys. (3). 4. (1842). 462.
8. Kopp.—"Ueber den Zusammenhang zwischen der chemischen Constitution und einigen physikalischen Eigenschaften bei flüssigen Verbindungen." Ann. Chem. Pharm. 50. (1844). 71.
9. Schröder.—"Volumes moléculaires des substances organiques liquides." Ann. Chim. Phys. (3). 13. (1845). 157.
10. Löwig.—"Ueber den Zusammenhang zwischen den Atomvolumen und Atomgewichten der flüssigen organischen Verbindungen." Poggend. Annal. 64. (1845). Two papers; pages 209, 515.
11. Playfair and Joule.—"On atomic volume and specific gravity." Chem. Soc. Memoirs, 2. (1845). 401. Second paper, vol. 3. (1848). 57.

12. FILHOL.—"Études sur le rapport qui existe entre le poids atomique, la forme cristalline, et la densité des corps." Ann. Chim. Phys. (3). 21. (1847). 415.

13. KOPP.—"Untersuchungen über das specifische Gewicht, die Ausdehnung durch die Wärme und den Siedpunkt einiger Flüssigkeiten." Poggend. Annal. 72. (1847). Two papers; pages 1, 223.

14. PLAYFAIR AND JOULE.—"Researches upon atomic volume and specific gravity." Journ. Chem. Soc. 1. (1849). Two papers; pages 121, 139.

15. PIERRE.—"Mémoire sur la thermométrie, et en particulier sur la comparison du thermomètre à air avec les thermomètres à liquides." Compt. Rend. 27. (1848). 213. Poggend. Annal. 76. 458.

16. DELFFS.—Abstract of important paper by. Ann. Chem. Pharm. 92. (1854). 277.

17. KOPP.—"Beiträge zur Stöchiometrie der physikalischen Eigenschaften chemischer Verbindungen." Ann. Chem. Pharm. 96. (1855). Three papers; pages 1, 153, 303.

18. KOPP.—"Untersuchungen über das specifische Gewicht, die Ausdehnung durch die Wärme, und den Siedpunkt einiger Flüssigkeiten." Ann. Chem. Pharm., 94, 257. 95, 307. 98, 367. (1855 and 1856).

19. KOPP.—"Ueber die specifischen Volume der Stickstoffhältigen Verbindungen." Ann. Chem. Pharm. 100. (1856). 19.

20. SCHIFF.—"Ueber die specifischen Volume einiger Reihen anorganischer Verbindungen." Ann. Chem. Pharm. 107. (1858). 64.

21. SCHIFF.—"Ueber die specifischen Volume anorganischer Verbindungen." Ann. Chem. Pharm. 108. (1858). 21.

22. D'ANDREÉFF.—Recherches sur le poids spécifique et la dilatation par la chaleur de quelqes gaz condensés." Ann. Chim. Phys. (3). 56. (1859). 317.

23. SCHRÖDER.—"Neue Beiträge zur Volumentheorie." Poggend. Annal, 106. (1859). 226. Second paper; 107. 113.

24. TSCHERMAK.—"Ueber den Zusammenhang zwischen der chemischen Constitution und dem relativen Volumen bei flüssigen Verbindungen." Sitzungsb. Wien Akad. 35, 18. Second paper; 37. 525.

25. SCHIFF.—"Die specifischen Volume starrer Verbindungen." Ann. Chem. Pharm. 112. (1859). 88.

26. BÖDEKER.—"Die Beziehungen zwischen Dichte und Zusammensetzung bei festen und liquiden Stoffen. Ein Supplement zu den Lehrbüchern der Chemie und Mineralogie." Leipzig. (1860).

27. TSCHERMAK.—"Die Dichte im Verhältnisse zur Form und chemischen Beschaffenheit der Krystalle." Sitzungsb. Wien Akad. 45. (2). (1862). 603.

28. ŠAFAŘIK.—"Beiträge zur Kenntniss der specifischen Volumen fester Verbindungen." Journ. für Prakt. Chem. 90. (1863). 12.

29. H. L. BUFF.—"Ueber eine Beziehung des Gesetzes der multiplen Proportionen zu den specifischen Volumen." Ann. Chem. Pharm. 4th Supp. (1865-6). 129.

30. LOUGUININE.—"Étude des densités et dilatations de la benzine et de ses homologues."—Ann. Chim. Phys. (4). 11. (1867). 453.

31. KREMERS.—"Ueber das relative Volum der Verbindungen erster Ordnung." Poggend. Annal. 130. (1867). 77.

32. HAAGEN.—"Bestimmung der Brechungsexponenten und specifischen Gewichte einiger flüssigen Haloidverbindungen." Poggend. Annal. 131. (1867). 117.

33. JUNGFLEISCH."—"Sur quelques relations entre les points de fusion, les points d'ebullition, les densités, et les volumes spécifiques." Compt. Rend. 64. (1867). 911.

II. PAPERS UPON EXPANSION.

See also several of the papers already cited.

34. DANIELL.—"On a new register-pyrometer, for measuring the expansion of solids, and determining the higher degrees of temperature upon the common thermometric scale." Phil. Trans. (1830). 237.

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84. Kopp.—"On the relation between boiling point and composition in organic compounds." Phil. Trans. (1860). 257.

85. Kopp.—"Ueber die Siedepunkte dér Kohlenwasserstoffe $C_n H_{2n-6}$." Ann. Chem. Pharm. 5th supp. (1867). 315.

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EXPLANATORY NOTES.

EACH of the following tables, with two exceptions, is divided into five columns. The first contains the Name of the Substance, the second its Formula, the third its Specific Gravity, the fourth its Boiling Point, and the fifth its Melting Point. From the Table of Elementary Substances, however, the column for formula is omitted; and in the Table of Alloys, no boiling points are given. The authorities are added as foot-notes to each page.

Some abbreviations are necessarily used. In the first column, the letter "s." placed after the name of any substance, shows that that substance is a solid, or was examined in the solid state. The letter "l." similarly used, stands for *liquid*. Thus, "Acetic acid. s.," stands for *solid* acetic acid; and "Chlorine. l.," for *liquefied* chlorine.

Among organic substances, the abbreviations "iso," and the Greek letters alpha or beta are sometimes appended to the name of a substance. These are simply to distinguish isomers from each other; as, for instance, isopropyl from propyl compounds, and alpha- from beta-xylidine.

In the Specific Gravity column the letters "s." and "l." are also employed, and indicate that the determinations to which they are appended are for the substances in question in the solid or liquid state. The letter "a." attached to a determination shows the latter to be merely approximate. Expressions like "m. of 3," "m. of 5," &c., affixed to a number, show it to be a *mean of 3*, *mean of 5*, &c., determinations. And the abbreviations "Precip.," "Artif.," "Cryst.," "Ign.," &c., stand simply for the words precipitated, artificial, crystallized, and ignited, and express of course the character of the material employed in making a determination.

In the column devoted to Boiling Points, the letter "a." is again used to express approximation. Thus, "160° a." stands for *about 160.*° When barometric measurements are given, "m. m." of course stands for millimetres. The plus and minus signs are employed to show that a determination is a

little above or a little below accuracy. 100°+, would mean a little more than 100°, and 100°—, a little less. "d.," or "p.d.," affixed to a boiling point determination, indicates that the substance in question is either *decomposed*, or *partly decomposed* in boiling.

In the column of Melting Points, the letters "a.," "d.," and "p.d.," and the plus and minus signs, are used precisely as with the Boiling Points. The letter "s.," however, shows that the temperature attached is that at which the body named *solidifies*. "rs." stands for *resolidification*. Thus, "82.° rs. 78°" would show that a body melted at 82°, and resolidified at 78.°

In the lists of Authorities a variety of abbreviations are used, to point out the whereabouts of the original paper, or the source from which a determination was obtained. References to "Dana's Mineralogy," "Watts' Dictionary," "Strecker's Lehrbuch," "Kekule's Lehrbuch," and "Weltzien's Systematische Zusammenstellung der Organischen Verbindungen," will of course be readily recognized. But most of the abbreviations require detailed explanation.

A single number appended to the name of an authority, refers to the list of papers accompanying the tables. Thus, "Kopp. 18," would refer to Kopp's paper numbered 18 in the list; or "Filhol. 12," to Filhol's paper numbered 12.

Two numbers affixed to a name, refer to the "Jahresbericht," volume and page. Thus, "Kenngott. 6. 853," refers to vol. 6, p. 853 of the above-named work; or "Luca. 13. 98," to vol. 13, p. 98.

The following abbreviations refer to various periodicals,—the series, (when necessary), volume, and page, being always given. If the number for the series be omitted, the *first* series is understood to be the one referred to. The page is sometimes that at which a paper begins, and sometimes merely that upon which a given determination is to be found.

Ann. Phil. "Annals of Philosophy."

A. C. P. "Annalen der Chemie und Pharmacie."

A. C. Phys. "Annales de Chimie et de Physique."

B. S. C. "Bulletin de la Société Chimique."

Chem. N., or Chem. News. "Chemical News."

Chem. Gaz. "Chemical Gazette."

C. R. "Comptes Rendus."

C. S. J., or J. C. S. "Journal of the Chemical Society."

C. S. Mem. "Chemical Society's Memoirs."

D. P. J., Ding. J., or Dingler's J. "Dingler's Polytechnisches Journal."

Erd. J. "Erdmann's Journal."

Gilb. Ann. "Gilbert's Annalen."

J. F. P. "Journal für Praktische Chemie."

Mem. Amer. Acad. "Memoirs of the American Academy."

Nich. J., or Nich. Journ. "Nicholson's Journal."

P. A. "Poggendorf's Annalen." "Erganz. bd." refers to the "Erganzungs Band."

P. M. "Philosophical Magazine."

P. T., or Phil. Trans. "Philosophical Transactions."

Q. J. S. "Quarterly Journal of Science."

Schw. J., or Schweig. J. "Schweigger's Journal."

S. J., or Sill. J. "Silliman's American Journal."

Wien Ak. "Sitzungsberichte der Akademie zu Wien."

Zeit. An. Chem., or Zeit. Anal. Chem. "Zeitschrift für Analytische Chemie."

A TABLE
OF
SPECIFIC GRAVITIES.

BOILING POINTS AND MELTING POINTS,
FOR SOLIDS AND LIQUIDS.

I. Elementary Substances.

Name.		Specific Gravity.	Boiling Point.	Melting Point.
Hydrogen.				
Fluorine.				
[1] Chlorine.	l.	1.33, 15°.5.		
[2] "			-33.°6.760.m.m.	
[3] Bromine.		2.966.	47.°	
[4] "		2.98–2.99, 15.°	45.°	
[5] "		3.18718, 0.°	63.°760m.m.	
[6] "			58.° "	
[7] "				s.—22.°
[8] Iodine.		4.948.	175°–180.°	107.°
[9] "		4.9173, 40.°3.		
[10] "		4.886, 60.°		
[11] "	s.	4.857, 79.°6.		
[12] "		4.841, 89.°8.		
[13] "		4.825, 107.°		
[14] "		4.004, 107.°		
[15] "		3.988, 111.°7.		
[16] "		3.944, 124.°3.		
[17] "	l.	3.918, 133.°5.		
[18] "		3.866, 151.°		
[19] "		3.796, 170.°		
[20] Lithium.		0.578,–0.589.		180.°
[21] Sodium.		0.9348.		
[22] "		0.97223, 15.°		
[23] "				s. 97.°6.
[24] "		0.985.		
[25] "				95.°6.

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[2] Regnault. 16.70. [337.
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[6] Andrews. P. A. 75.335.
[7] Watts' Dictionary.
[8] Gay-Lussac. A. C. Phys. 1.91.5.
[9] Billet. 8.46.
[10] Billet. 8.46.
[11] Billet. 8.46.
[12] Billet. 8.46.
[13] Billet. 8.46.
[14] Billet. 8.46.
[15] Billet. 8.46.
[16] Billet. 8.46.
[17] Billet. 8.46.
[18] Billet. 8.46.
[19] Billet. 8.46.
[20] Bunsen. 8.324.
[21] Davy. P. T. 1808.21.
[22] Gay-Lussac and Thénard. Watts' Dictionary.
[23] Regnault. 9.43.
[24] Schröder. 12.12.
[25] Bunsen. 16.178.

D. P. J., Ding. J., or Dingler's J. "Dingler's Polytechnisches Journal."

Erd. J. "Erdmann's Journal."

Gilb. Ann. "Gilbert's Annalen."

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Nich. J., or Nich. Journ. "Nicholson's Journal."

P. A. "Poggendorf's Annalen." "Erganz. bd." refers to the "Erganzungs Band."

P. M. "Philosophical Magazine."

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Q. J. S. "Quarterly Journal of Science."

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A TABLE
OF
SPECIFIC GRAVITIES.

BOILING POINTS AND MELTING POINTS,
FOR SOLIDS AND LIQUIDS.

I. Elementary Substances.

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Hydrogen.				
Fluorine.				
[1] Chlorine.	l.	1.33, 15°.5.		
[2] "			-33.°6.760.m.m.	
[3] Bromine.		2.966.	47.°	
[4] "		2.98–2.99, 15.°	45.°	
[5] "		3.18718, 0.°	63.°760m.m.	
[6] "			58.° "	
[7] "				s.—22.°
[8] Iodine.		4.948.	175°–180.°	107.°
[9] "		4.9173, 40.°3.		
[10] "		4.886, 60.°		
[11] "	s.	4.857, 79.°6.		
[12] "		4.841, 89.°8.		
[13] "		4.825, 107.°		
[14] "		4.004, 107.°		
[15] "		3.988, 111.°7.		
[16] "		3.944, 124.°3.		
[17] "	l.	3.918, 133.°5.		
[18] "		3.866, 151.°		
[19] "		3.796, 170.°		
[20] Lithium.		0.578,–0.589.		180.°
[21] Sodium.		0.9348.		
[22] "		0.97223, 15.°		
[23] "				s. 97.°6.
[24] "		0.985.		
[25] "				95.°6.

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[1] Watts' Dictionary.
[2] Regnault. 16.70. [337.
[3] Balard. A. C. Phys. (2).32.
[4] Löwig. Watts' Dictionary.
[5] Pierre. 45.
[6] Andrews. P. A. 75.335.
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[8] Gay-Lussac. A. C. Phys. 1.91.5.
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[10] Billet. 8.46.
[11] Billet. 8.46.
[12] Billet. 8.46.
[13] Billet. 8.46.
[14] Billet. 8.46.
[15] Billet. 8.46.
[16] Billet. 8.46.
[17] Billet. 8.46.
[18] Billet. 8.46.
[19] Billet. 8.46.
[20] Bunsen. 8.324.
[21] Davy. P. T. 1808.21.
[22] Gay-Lussac and Thénard. Watts' Dictionary.
[23] Regnault. 9.43.
[24] Schröder. 12.12.
[25] Bunsen. 16.178.

	Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Potassium.	0.865, 15.°		
[2]	"	0.870.		
[3]	" Melted.	0.8427.		
[4]	"			s. 55.°4.
[5]	"			62.°5.
[6]	Rubidium.	1.52.		38.°5.
[7]	Caesium.			
[8]	Silver.			1034.°
[9]	"			1000.°
[10]	"	10.472.		
[11]	"	10.362, 10.°		
[12]	"			999.°
[13]	"			1024.°
[14]	"	10.43–10.47.		
[15]	"	10.575.		
[16]	"	10.4282.		
[17]	"	10.434.		
[18]	"	10.522.		
[19]	"	10.537.		
[20]	"	10.482.		
[21]	"	10.505, after fusion.		
[22]	"	10.5665, pressed.		
[23]	"	10.5532, precipitated		
[24]	"	10.6191, powder.		
[25]	"	10.5287, m. of 13.		
[26]	"	10.5237, m. of 4.		
[27]	"	10.5283, m. of 8.		
[28]	"	10.468, 13.°		
[29]	"	10.77, 15.°5. Native.		
[30]	" Melted.	9.131.		
[31]	" "	9.281.		
[32]	Thallium.	11.862.		290.°
[33]	"	11.808, wire.		
[34]	"	11.853, cast.		

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[6] Bunsen. 16.185.
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[10] Brisson. See 11.
[11] Biddle. P. M. 30.152.
[12] Prinsep. P. T. 1828.94.
[13] Daniell. P. T. 1830.237.
[14] Lengsdorf.
[15] Christomanos.
[16] Karsten. 3.
[17] Breithaupt. J. F. P. 11. 151.
[18] Playfair and Joule. 11.
[19] Playfair and Joule. 11.
[20] Karmarsch. J. F. P. 43.193.
[21] G. Rose. P. A. 73.1.
[22] G. Rose. P. A. 73.1.
[23] G. Rose. P. A. 73.1.
[24] G. Rose. P. A. 73.1.
[25] G. Rose. P. A. 73.1.
[26] G. Rose. P. A. 73.1.
[27] G. Rose. P. A. 73.1.
[28] Holzmann. 13.112.
[29] Forbes. P. M. (4). 30.139.
[30] Playfair and Joule. 11.
[31] Playfair and Joule. 11.
[32] Lamy. 15.180.
[33] De la Rive. 16.248.
[34] De la Rive. 16.248.

Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Thallium.	11.777.		
[2] «	11.900.		
[3] «	11.81, cast.		
[4] «	11.88, pressed.		
[5] «	11.91, wire.		
[6] Oxygen.			
[7] Sulphur.	1.9907, roll.		
[8] «	1.868, «		
[9] «	2.086, flowers.		
[10] «	1.898, crystallized.		
[11] «	1.927, from solution.		
[12] «	1.989, crystallized.		
[13] «	1.9777–2.0000, roll.		
[14] «	2.072, prismatic.		
[15] «	2.086, native.		
[16] «	2.027, soft.		
[17] «	2.05001, native.		
[18] «	1.9889, from fusion.		
[19] «		440.°	
[20] «	1.982, prismatic.		
[21] «	2.066, native.		111.°5.
[22] «	2.0518, from solution.		
[23] «	1.957, soft.		
[24] «			115.°
[25] «	1.919, soft.		
[26] «	1,928, «		
[27] «	1.958, prismatic.		
[28] «	2.070, native.		
[29] «	2.063, from solution.		
[30] «	2.010, crystallized.		
[31] «	1.913, flowers.		
[32] «	1.921, waxy.		

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[2] Werther. 17.247.
[3] Crookes. J. C. S. 1864.112.
[4] Crookes. J. C. S. 1864.112.
[5] Crookes. J. C. S. 1864.112.
[7] Brisson.
[8] Böckmann.
[9] Gehler.
[10] Fontenelle.
[11] Bischof.
[12] Breithaupt.
[13] Thomson.
[14] Mohs.
See the paper by Marchand and Scheerer, cited below
[15] Dumas & Roget.
[16] Osann.
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[20] Marchand and Scheerer. J. F. P. 24.129.
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[22] Marchand and Scheerer. J. F. P. 24.129.
[23] Marchand and Scheerer. J. F. P. 24.129.
[24] Person. 1.73. [365.
[25] C. J. St. Claire Deville. 1. 365.
[26] C. J. St. Claire Deville. 1. 365.
[27] C. J. St. Claire Deville. 1. 365.
[28] C. J. St. Claire Deville. 1. 365.
[29] C. J. St. Claire Deville. 1. 365.
[30] Playfair and Joule. 11.
[31] Playfair and Joule. 11.
[32] Playfair and Joule. 11.

	Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Sulphur. Melted.	1.801. } Extremes of five		
[2]	" "	1.815. } determinations.		
[3]	"			114.°5. Octahedral.
[4]	"			120.° Prismatic.
[5]	"		490.°760 m. m.	
[6]	"		447.°	
[7]	Selenium.	4.3–4.32.		
[8]	"	4.31.		
[9]	"	4.808, 15.°		217.°
[10]	"	4.805. } crystallized		
[11]	"	4.796. } from fusion.		
[12]	"	4.276. } 20.°		
[13]	"	4.286. } Amorphous.		
[14]	"	4.245. } Red.		
[15]	"	4.275. } Precipitated.		
[16]	"	4.250. } Ditto, after		
[17]	"	4.297. } heating to 50.°		
[18]	"	4.460.		
[19]	"	4.509. } Crystallized.		
[20]	"	4.700.		
[21]	"	4.760. } 15.°crystallized		
[22]	"	4.788. } from solution.		
[23]	"	4.80. } Black.		
[24]	"	4.81. }		
[25]	"	4.26. } Red.		
[26]	"	4.28. } Precipitated.		
[27]	Tellurium.	6.115.		
[28]	"	6.138.		
[29]	"	6.2445, m. of 5.		
[30]	"	6.343.		
[31]	"	6.180.		
[32]	"			a. 500.°

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[6] Hittorf. 18.130.
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Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Calcium.	1.566.		
[2] "	1.584.		
[3] "	1.584.		
[4] "	1.55.		
[5] "	1.6–1.8.		
[6] Strontium.	2.504.		
[7] "	2.580.		
[8] "	2.4.		
[9] Barium.	a. 4.00.		
[10] Lead.	11.445.		
[11] "	11.352.		
[12] "	11.207.		
[13] "	11.388.		
[14] "	11.3303.		334.°
[15] "	11.346, 15.°5.		s. 322.°
[16] "	11.352.		
[17] "			322.°
[18] "	11.3888.		
[19] "	11.070.		
[20] "	11.275.		
[21] "	11.280.		
[22] "	11.298.		
[23] "			332.°
[24] "			326.°
[25] "	11.370, 0.°		
[26] "	11.3525, 18.°		
[27] "	11.395, 4.°		
[28] "	11.254–11.363.		
[29] "	11.376, 14.°		
[30] "	10.450.		
[31] " Melted.	10.513.		
[32] "	10.563.		

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[17] Daniell. 34.
[18] Karsten. 3.
[19] Playfair and Joule. 11.
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[31] Playfair and Joule. 11.
[32] Playfair and Joule. 11.

Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Indium.	7.110. In grains.		
[2] "	7.147. 20.°4.		
[3] "	7.277. In laminæ.		
[4] "	7.362, 15.°		
[5] "	7.421, 16.°8.		176.°
[6] Chromium.	7.3.		
[7] "	6.81, 25.° Crystallized.		
[8] "	6.20. Reduced by K Cy.		
[9] Manganese.	6.861–7.10.		
[10] "	8.03.		
[11] "	8.013.		
[12] "	7.138–7.206.		
[13] Iron.	7.4839, bar.		
[14] "	7.8707.		
[15] "	7.865.		
[16] "	7.788.		
[17] "	7.790, wrought.		
[18] "	7.130. Reduced by C.		
[19] "	8.1393, 15.°5. Electrolytic.		
[20] "	7.50. Reduced by zinc vapor.		
[21] "	7.84.		
[22] "	7.6305. Wire in several different conditions.		
[23] "	7.6000.		
[24] "	7.7169.		
[25] "	7.7312.		
[26] "	7.7433. Hammered.		
[27] "	7.998. 10.°		
[28] "	8.007. Reduced by H.		
[29] "	6.03. Reduced by H.		
[30] " Meteoric.	7.318. From Guilford.		
[31] " "	7.82.		
[32] " "	7.814.		

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[31] Rumler. See 23.
[32] Patera. See 23.

	Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Nickel.	7.807.		
[2]	"	8.279.		
[3]	"	8.380.		
[4]	"	8.402.		
[5]	"	8.477.		
[6]	"	8.637.		
[7]	"	7.861. } Reduced by		
[8]	"	7.803. } hydrogen.		
[9]	"	8.88, 4.° Wire.		
[10]	"	8.975. } Reduced by		
[11]	"	9.261. } hydrogen.		
[12]	"	8.900.		
[13]	Cobalt.	8.710.		
[14]	"	8.485.		
[15]	"	8.500.		
[16]	"	8.513.		
[17]	"	8.538.		
[18]	"	8.558.		
[19]	"	7.718. } Reduced by		
[20]	"	8.260. } hydrogen.		
[21]	"	8.957. Red. by H.m.of 5.		
[22]	Uranium.	18.40.		
[23]	"	18.33.		
[24]	Copper.			1000°–1200°.
[25]	"			1207.°
[26]	"	8.895.		
[27]	"	8.878, rolled. }		
[28]	"	8.788, cast. }		
[29]	"	8.83, cast. }		
[30]	"	8.9463, drawn. }		
[31]	"	8.9587, hammered. }		
[32]	"	8.78.		
[33]	"	8.900.		

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	Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Copper.			1091.°
[2]	"	8.667.		
[3]	"	8.721.		
[4]	"	8.6225. Wire, in several different conditions.		
[5]	"	8.3912. Wire, in several different conditions.		
[6]	"	8.7059. Wire, in several different conditions.		
[7]	"	8.8787. Wire, in several different conditions.		
[8]	"	8.8893, hammered.		
[9]	"	8.940, crystallized.		
[10]	"	8.921, cast.		
[11]	"	8.939. Various sorts of wire.		
[12]	"	8.949. Various sorts of wire.		
[13]	"	8.930. Various sorts of wire.		
[14]	"	8.951. Various sorts of wire.		
[15]	"	8.952, sheet.		
[16]	"	8.931, pressed.		
[17]	"	8.914, electrolytic.		
[18]	"	8.428. Finely divided.		
[19]	"	8.483. Finely divided.		
[20]	"	8.360. Finely divided.		
[21]	"	8.884. Electrolytic.		
[22]	"	8.941. Electrolytic.		
[23]	"	8.934. Electrolytic.		
[24]	"	8.367. 4.° Finely divided.		
[25]	"	8.41613. 4.° Finely divided.		
[26]	"	8.902, 12.°		
[27]	"	8.838, native.		
[28]	"	8.952–8.958.		
[29]	"	8.916. Electrolytic, cast.		
[30]	"	8.958. Electrolytic, cast.		
[31]	"	8.853. Electrolytic, wire.		
[32]	"	8.733. Electrolytic, wire.		
[33]	Ruthenium.	11.0–11.4.		

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[2] Mallet. Ding. J. 85.378.
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Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Rhodium.	11.0.		
[2] "	11.2.		
[3] "	11.0.		
[4] "	12.1.		
[5] Palladium.	11.3–11.8.		
[6] "	12.148.		
[7] "	11.852.		
[8] "	12.0.		
[9] "	11.041, 18.°		
[10] "	10.923.		
[11] "	11.628.		
[12] "	11.30.		
[13] "	11.80, hammered.		
[14] "	11.752.		
[15] "	11.4, 22.°5.		
[16] Platinum.	20.85.		
[17] "	20.98.		
[18] "	21.06.		
[19] "	19.5, cast.		
[20] "	20.3, hammered.		
[21] "	21.0, wire.		
[22] "	21.7, wire.		
[23] "	21.061.		
[24] "	21.45.		
[25] "	21.47–21.53.		
[26] "	17.7, cast.		
[27] "	21.3.		
[28] "	20.9, hammered.		
[29] "	21.47, spongy.		
[30] "	21.16, wire.		
[31] "	21.4, wire.		
[32] "	21.53. wire.		
[33] "	21.25, hammered.		

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Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Platinum.	17.572.		
[2] "	15.780. Spongy.		
[3] "	16.319.		
[4] "	17.89. Platinum black.		
[5] "	21.2668. 0.°		
[6] "	21.3092.		
[7] "	21.31.		
[8] "	21.16. Hammered.		
[9] "	21.23.		
[10] "	16.634, spongy.		
[11] "	20.9815.		
[12] "	20.7732. Black.		
[13] "	22.8926. Precipitated.		
[14] "	22.0345.		
[15] "	26.1418, 15.°7. (?) Black.		
[16] "	17.766, black.		
[17] "	21.169. Spongy.		
[18] "	21.243.		
[19] "	21.15.		
[20] "	21.15.		
[21] Iridium.	18.68, porous globule.		
[22] "	21.78.		
[23] "	21.83.		
[24] "	18.6088, black.		
[25] "	21.15.		
[26] Osmium.	21.40.		
[27] Molybdenum.	8.490. 8.615. 8.636.		
[28] "	8.60.		
[29] "	8.56, reduced by K Cy.		
[30] Tungsten.	17.6.		
[31] "	17.22.		
[32] "	17.4.		
[33] "	19.261, 12.°		

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[29] Loughlin. 21.220.
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	Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Tungsten.	16.54.		
[2]	"	17.50.		
[3]	"	18.26.		
[4]	"	17.1–17.3. Red. by H.		
[5]	"	17.9–18.12. " " C.		
[6]	"	16.6. Prepared by three different methods.		
[7]	"	17.2.		
[8]	"	18.447, 17.°		
[9]	Zinc.	6.861.		
[10]	"	6.862.		
[11]	"			412.°
[12]	"	6.9154.		
[13]	"	6.869. 6.992. 6.956.		
[14]	"			423.°
[15]	"	7.03–7.20.		
[16]	"	6.966–6.975, 12.°		
[17]	"		1040.°	
[18]	"	7.21.		
[19]	"	7.146.		
[20]	"	6.895.		
[21]	" Melted.	6.522. 6.511. 6.504.		
[22]	Cadmium.	8.604.		
[23]	"	8.670.		
[24]	"	8.650.		
[25]	"	8.6355.		
[26]	"			315.°
[27]	"			320.°
[28]	"			320.°
[29]	"		860.°	
[30]	"	8.655, 11.°		
[31]	"	8.54, Pure.		
[32]	"	8.566, Pure.		
[33]	"	8.667, Pure.		
[34]	"	8.648, commercial.		

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[9] Brisson. See 11.
[10] Berzelius. See 11.
[11] Daniell. 35.
[12] Karsten. 3.
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[14] Person. 1.73.
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[32] Schröder. 23.
[33] Schröder. 23.
[34] Schröder. 23.

Name.		Specific Gravity.	Boiling Point.	Melting Point.
[1] Magnesium.		2.24.		
[2] "		1.7430. 5.°		
[3] "		1.69–1.71, 17.°		
[4]		1.75.		
[5] Mercury.	Solid.	14.391.		
[6] "	"	14.485,–60.°		
[7] "	"	14.0, a.		
[8] "	"	15.19.		
[9] "	Liquid.	13.568, 15.° 5.	346.°5.	
[10] "	"		356.°25.	
[11] "	"	13.613, 10.°		
[12] "	"		349.°	
[13] "	"	13.568.		
[14] "	"	13.575.		
[15] "	"			—39.°44.
[16] "	"		360.°	
[17] "	"	13.5886, 4.°		
[18] "	"	13.535, 26.°		
[19] "	"	13.588597.		
[20] "	"	13.5592.		
[21] "	"	13.59599.		
[22] "	"	13.59602. 0.°		
[23] "	"	13.59578.		
[24] "	"	13.595, 0.°		
[25] "	"	13.573, 15.°		
[26] "	"		357.°25. 760m.m.	
[27] "	"	13.603, 12.°		
[28] "	"	13.569, 16.°6.		
[29] Nitrogen.				
[30] Boron.		2.68. Crystallized.		
[31] Phosphorus.			250.°	
[32] "			288.°	
[33] "			290.°	

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[2] Bunsen. 5.363.
[3] Kopp. See 23.
[4] Deville and Caron. 10.148.
[5] Schulze.
[6] Biddle. P. M. 30.153.
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[26] Regnault. 16.70.
[27] Schiff.
[28] B. Stewart.
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[31] Heinrich. } Watts' Dictionary.
[32] Dalton. }
[33] Pelletier. }

Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Phosphorus. Common.	1.77.		
[2] " "	2.09.		
[3] " "	1.800.		
[4] " "			44.°2.
[5] " "			44.°2.
[6] " "	1.826–1.840, 10.°		
[7] " "	1.8262–1.8265, 10.°		
[8] " "	1.823, 35.°		
[9] " Melted.	1.744.		
[10] " "	1.88, 45.°		
[11] " "	1.763, {Cooled below melting point.		
[12] " Red.	1.964, 10.°		
[13] " "	2.089–2.106, 17.°		
[14] " "	2.14.} Crystallized.		
[15] " "	2.23.} Two preparations.		
[16] " "	2.34, 15.°5. "Metallic."		
[17] Vanadium.	5.5, 15.°		
[18] Arsenic.	5.763.		
[19] "	5.766.		
[20] "	5.763.		
[21] "	5.884.		
[22] "	5.700–5.959.		
[23] "	5.672.		
[24] "	5.6281.		
[25] "	5.736, native.		
[26] "	5.722–5.734, native.		
[27] "	5.230.		
[28] "	5.395, 12.°5.		
[29] "	5.726,–5.728, 14.°		
[30] " Fused.	5.709, 19.°		
[31] " Amorphous.	4.710–4.716, 14.°		
[32] Antimony.	6.702.		
[33] "	6.712.		
[34] "	6.733.		

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[2] Böttger. Watts' Dictionary.
[3] Playfair and Joule. 11.
[4] Person. 1.80.
[5] Desains. 1.84.
[6] Schrötter. 1.336.
[7] Kopp. A. C. P. 93.129.
[8] Gladstone and Dale. 12.73.
[9] Playfair and Joule. 11.
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[13] Schrötter. 3.262.
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[18] Brisson.
[19] Mohs.
[20] Stromeyer. } See 11.
[21] Turner.
[22] Guibourt.
[23] Herapath. 1.
[24] Karsten. 3.
[25] Breithaupt. J. F. P. 16.475.
[26] Breithaupt. J. F. P. 11.151.
[27] Playfair and Joule. 11.
[28] Ludwig. 12.183.
[29] Bettendorf. 20.253.
[30] Mallet. B. S. C. 18.438.
[31] Bettendorf. 20.253.
[32] Brisson.
[33] Hatchett. } See 11.
[34] Böckmann.

Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Antimony.	6.852.		
[2] "	6.860.		
[3] "	6.646.		
[4] "	6.610.		
[5] "	6.7006.		
[6] "	6.715.		
[7] "	6.707–6.718; 17° to 21.°		
[8] "	6.713, 14.°		
[9] "	6.697.		
[10] "			450.°
[11] " Melted.	6.646–6.529.		
[12] " Amorphous.	5.74–5.83.		
[13] Bismuth.	9.67.		
[14] "	9.822.		
[15] "	9.800.		
[16] "	9.882.		
[17] "	9.8827.		
[18] "	9.831.		
[19] "	9.6542.		
[20] "	9.799, 19°, pure.		
[21] "	9.783, commercial.		
[22] "	9.556, after great pressure.		
[23] "			268.°3.
[24] "			270.°
[25] "			264.°
[26] "	9.935, crystallized.		
[27] "	9.677, quickly cooled.		
[28] "	9.823, 12.°		
[29] " Melted.	9.811, 9.756, 9.905, 9.721.		
[30] "	9.759, 9.701, 9.680.		
[31] Gold.	19.258.		
[32] "	19.207, hammered.		
[33] "	19.3–19.4.		

AUTHORITIES.

[1] Muschenbroek. [2] Bergmann. [3] Mohs. [4] Breithaupt. } See 11.

[5] Karsten. 3.

[6] Marchand & Scheerer. J. F. P. 27.193.

[7] Dexter. 10.210.

[8] Matthiessen. 13.112.

[9] Schröder. 23.

[10] Watts' Dictionary.

[11] Playfair and Joule. 11.

[12] Gore. 13.172.

[13] Muschenbroek. [14] Brisson. [15] Leonhard. [16] Thénard. } See 11.

[17] Berzelius. See paper of Marchand & Scheerer.

[18] Herapath. 1.

[19] Karsten. 3.

[20] Marchand & Scheerer. J. F. P. 27.193.

[21] Marchand & Scheerer. J. F. P. 27.193.

[22] Marchand & Scheerer. J. F. P. 27.193.

[23] Rudberg. 1.71.

[24] Person. 1.72.

[25] Watts' Dictionary.

[26] C. St. Claire Deville. 8.15.

[27] C. St. Claire Deville. 8.15.

[28] Holzmann. 13.112.

[29] Playfair and Joule. 11.

[30] Schröder. 23.

[31] Brisson. See 11.

[32] Elliot. [33] Lewis. } See Rose's paper.

	Name.		Specific Gravity.	Boiling Point.	Melting Point.
[1]	Gold.				1200.°
[2]	"				1380.°
[3]	"				1144.°
[4]	"		19.3336, 17.°5, pressed.		
[5]	"		19.7439. 17.°5. Precipitated with $FeSO_4$.		
[6]	"		20.6882. Extremes of 8 det.		
[7]	"		19.4791. Precip. by oxalic acid.		
[8]	"		19.4941. " " "		
[9]	"		19.265, 13.°		
[10]	Carbon.	Diamond.	3.550.		
[11]	"	"	3.492.		
[12]	"	"	3.520.		
[13]	"	"	3.334.		
[14]	"	"	3.5.		
[15]	"	"	3.55.		
[16]	"	"	3.5295.		
[17]	"	"	3.53. From Bohemia.		
[18]	"	Graphite.	2.14.		
[19]	"	"	2.229.		
[20]	"	"	2.273.		
[21]	"	"	2.14.		
[22]	"	"	2.5.		
[23]	"	"	2.3285.		
[24]	"	"	2.3162.		
[25]	"	"	1.802. 20.°		
[26]	"	"	1.844. Purified.		
[27]	"	"	2.25–2.26. "		
[28]	"	"	2.105. Extremes of 29 determinations, of samples		
[29]	"	"	2.585. fr. different localities.		
[30]	"	Gas Carbon.	1.885.		
[31]	Silicon.	Graphitoidal.	2.49, 10.°		
[32]	"	"	2.493.		
[33]	"	"	2.004. 2.194. 2.197.		

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[3] Daniell. 34.
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[6] G. Rose. P. A. 73.1.
[7] G. Rose. P. A. 73.1.

[8] G. Rose. P. A. 75.403.

[9] Holzmann. 13.112.

[10] Brisson.
[11] Grailich.
[12] Mohs.
} See 27.

[13] Shepard. See 27.

[14] Berzelius. A. C. P. 49.247.

[15] Pelouze.
[16] Thomson.
} Watts' Dictionary.

[17] Schafarik. P. A. 139.188.

[18] Breithaupt.
[19] Kenngott.
[20] Regnault.
} See 27.

[21] Fuchs. J. F. P. 7.353

[22] Berzelius. A. C. P. 49.247.

[23] Karsten. 3.

[24] Poggendorf. P. A. Erganz. bd. 1848. 363.

[25] Löwe. 8.297.
[26] Löwe. 8.297.

[27] Brodie. 12.68.

[28] Mené. 20.972.
[29] Mené. 20.972.

[30] Mené. 20.972.

[31] Wöhler. 9.347.

[32] Harmening. See 23.

[33] Winkler. 17.208 and 209.

Name.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Titanium.			
[2] Tin.	7.291.		
[3] "	7.295.		
[4] "	7.278,15.°5.		s. 238.°
[5] "	7.2911, 17.°		
[6] "	7. 285. 7.600.		
[7] "	7.5565, cast.		
[8] "			228.°
[9] "	7.2905.		
[10] "	7.245. 7.363. 7.330. 7.288		
[11] "			228.°5.
[12] "			235.°
[13] "	7.178, crystallized.		
[14] "	7.293, cast.		
[15] "	7.3043.		
[16] "	7.239. 7.373.		
[17] "	7.294, 13.°		
[18] "	7.291.		
[19] " Melted.	6.949. 6.913. 6.940.		
[20] Zirconium.	4.15.		
[21] Aluminum.	2.50, cast.		
[22] "	2.67, hammered.		
[23] Glucinum.	2.1.		
[24] Lanthanum.			
[25] Didymium.			
[26] Cerium.	5.5, 12.°		
[27] Yttrium.			
[28] Erbium.			
[29] Thorium.	7.657. 7.795.		
[30] Tantalum.	10.08–10.78.		
[31] Niobium.	6.0–6.6. Contains		
[32] "	6.15–7.37. hydrogen.		

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[5] Kupffer. A. C. Phys. (2). 40.285.
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[9] Karsten. 3.
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[11] Rudberg. 1.71.
[12] Person. 1.71.
[13] W. H. Miller. P. M. (3). 22.263.
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[23] Debray. 7.336.
[26] Wöhler. A. C. P. 144.251.
[29] Chydenius. 16.194.
[30] Rose. 9.366.
[31] Marignac. 21.214.
[32] Marignac. 21.214.

II. Fluorides. Inorganic.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hydrogen fluoride. l.	H F.	.9885, 13.°6.		
[2] " " l.	"	1.036, 15.°5.		
[3] " " l.	"	.9922, 11.°		
[4] " " l.	"	.9879, 12.°7.		
[5] " " l.	"	1.0609.		
[6] Potassium "	K F.	2.454, 12.°		
[7] Silver "	Ag F.	5.852, 15.°5.		
[8] Calcium "	Ca F_2.	3.183. m. of 60.		
[9] " "	"	3.15. American.		
[10] " "	"	3.138.		
[11] " "	"	3.162. Very pure.		
[12] Barium "	Ba F_2.	4.58, 13.°		
[13] Aluminum "	$Al_2 F_6$.	3.065. } 12.°		
[14] " "	"	3.13. }		
[15] Arsenic trifluoride.	As F_3.	l. 2.73.	63.°	
[16] Fluocerite.	Ce F_2. $Ce_2 F_6$.	4.7.		
[17] Hydro ammonic fluoride.	Am H F_2.	1.211, 12.°		
[18] Potassio titanic "	2 K F. Ti F_4.	2.0797, 12.°		
[19] Cryolite. Greenland.	3 Na F. Al F_3.	2.90–3.077.		
[20] " Miask.	"	2.692.		
[21] " "	"	2.95.		
[22] Chiolite.	3 Na F. 2 Al F_3.	2.72.		
[23] "	"	2.90.		
[24] "	"	2.842.–2.898.		
[25] Chodneffite.	2 Na F. Al F_3.	3.003.–3.077.		
[26] "	"	2.62–2.77.		

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[11] Luca. 13.98.
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[24] Rammelsberg. P. A. 74. 314.
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III. Inorganic Chlorides.

1st. ANHYDROUS SIMPLE CHLORIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hydrogen chloride.	H Cl.	l. 1.27.		
[2] Iodine mono chloride.	I Cl.			25.°
[3] Iodine tri chloride.	$I Cl_3$.			20°–25.°
[4] Lithium chloride.	Li Cl.	1.998.		
[5] " "	"	2.074.		
[6] Sodium "	Na Cl.	2.030.		
[7] " "	"	2.15.		
[8] " "	"	2.2001.		
[9] " "	"	2.078.		
[10] " "	"	2.150.		
[11] " "	"	2.011. m. of 3.		
[12] " "	"	2.26.		
[13] " "	"	2.24.		
[14] " "	"	2.204. }		
[15] " "	"	2.195. }		
[16] " "	"	2.142. }		
[17] " "	"	2.207. }		
[18] " "	"	2.135. { Native. Pure. Cryst.		
[19] " "	"	2.148.		
[20] " "	"	2.153. }		
[21] " "	"	2.161. }		
[22] " "	"	2.145.		
[23] " "	"	2.1629, 15.°		
[24] " "	"	2.1543.		
[25] Potassium "	K Cl.	1.836.		
[26] " "	"	1.9153.		
[27] " "	"	1.945.		
[28] " "	"	1.9367.		

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[1] Watts' Dictionary.
[2] Watts' Dictionary.
[3] Watts' Dictionary.
[4] Kremers. See 23.
[5] Schröder. 23.
[6] Unger. See 23.
[7] Leslie.
[8] Hassenfratz. A. C. Phys. 28.3.
[9] Karsten. 3.
[10] Kopp. 5.
[11] Playfair and Joule. 11.
[12] Mohs. See 23.
[13] Filhol. 12.
[14] Deville. See 23.
[15] Deville. See 23.
[16] Grassi. 1.39.
[17] Grassi. 1.39.
[18] T. S. Hunt. 8.976.
[19] Schiff. 21.
[20] Schröder. 23.
[21] Schröder. 23.
[22] Buignet. 15.14.
[23] Stolba. J. F. P. 97.503.
[24] Haagen. 32.
[25] Kirwan.
[26] Karsten. 3.
[27] Kopp. 5.
[28] Hassenfratz. A. C. Phys. 28.3.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Potassium chloride.	K Cl.	1.900.		
[2]	" "	"	1.97756, 4.°		
[3]	" "	"	1.994.		
[4]	" "	"	1.995.		
[5]	" "	"	1.995.		
[6]	" "	"	1.986.		
[7]	" "	"	1.94526, 15.°		
[8]	Ammonium "	$N H_4 Cl$.	1.450.		
[9]	" "	"	1.54425.		
[10]	" "	"	1.528.		
[11]	" "	"	1.578. m. of 3.		
[12]	" "	"	1.5333. 4.°		
[13]	" "	"	1.500.		
[14]	" "	"	1.522.		
[15]	" "	"	1.550.		
[16]	" "	"	1.5033.		
[17]	" "	"	1.5191. } 15.°		
[18]	" "	"	1.5209.		
[19]	Silver "	Ag Cl.	5.4548.		
[20]	" "	"	5.129.		
[21]	" "	"	5.4582. Fused.		
[22]	" "	"	5.5671. Blackened.		
[23]	" "	"	5.501. Unfused.		
[24]	" "	"	5.548.		
[25]	" "	"	5.55.		
[26]	" "	"	5.31. } Native.		
[27]	" "	"	5.43.		
[28]	" "	"	5.517.		
[29]	" "	"	5.5943.		
[30]	" "	"			260.
[31]	Thallium chloride.	Tl Cl.	7.00.		
[32]	" "	"	7.02.		
[33]	" "	"			260.°+
[34]	" sesqui chloride.	$Tl_2 Cl_3$.	5.9.		

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[1] Playfair and Joule. 11.
[2] Playfair and Joule. 14.
[3] Filhol. 12.
[4] Schiff. 21.
[5] Schröder. 23.
[6] Buignet. 14.15.
[7] Stolba. J. F. P. 97.503.
[8] Wattson. See 23. [28.3.
[9] Hassenfratz. A. C. Phys.
[10] Mohs. See 23 or 27.
[11] Playfair and Joule. 11.
[12] Playfair and Joule. 14.
[13] Kopp. 5.
[14] Schiff. 21.
[15] Buignet. 14.15.
[16] Stolba. J. F. P. 97.503.
[17] Stolba. J. F. P. 97.503.
[18] Stolba. J. F. P. 97.503.
[19] Proust. See 23.
[20] Herapath. 1.
[21] Karsten. 3.
[22] Karsten. 3.
[23] Karsten. 3.
[24] Boullay. 2.
[25] Gmelin. See 27.
[26] Domeyko.
[27] See Dana's Mineralogy.
[28] Schiff. 21.
[29] Schröder. 23.
[30] Watts' Dictionary.
[31] Willm.
[32] Lamy. 15.184.
[33] Watts' Dictionary.
[34] Lamy. 15.184.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] For compounds of Cl and 0, see oxides.				
[2] Sulphur chloride.	$S_2 Cl_2$.	1.687. l.	138.°	
[3] " "	"	1.686. l.	139.°	
[4] " "	"	1.6802.16°7. l.		
[5] " "	"	1.7055.0.° l.	144.°	
[6] " "	"		136.° 760m.m	
[7] " "	"	1.6828, 20.° l.	137°7. 761.4 [m. m.	
[8] Marchand and Dumas also obtained a mixture which they supposed to be S Cl_2.	Mixture near S Cl_2.	1.625. l. 1.62. l.	Variable. 64.°	
[9] Calcium chloride.	Ca Cl_2.	2.214.		
[10] " "	"	2.269.		
[11] " "	"	2.0401.		
[12] " "	"	2.480.		
[13] " "	"	2.240.		
[14] " "	"	2.205.		
[15] Strontium chloride.	Sr Cl_2.	2.8033.		
[16] " "	"	2.960.		
[17] Barium "	Ba Cl_2.	3.860.		
[18] " "	"	4.156.		
[19] " "	"	3.8.		
[20] " "	"	3.7037.		
[21] " "	"	3.750.		
[22] " "	"	3.820.		
[23] " "	"	3.872.		
[24] " "	"	3.886.		
[25] Lead "	Pb Cl_2.	5.29.		
[26] " "	"	5.238. Native.		
[27] " "	"	5.6824. Fused.		
[28] " "	"	5.8022. Not "		
[29] " "	"	5.802. Cryst.		
[30] " "	"	5.78.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lead chloride. Cryst.	$Pb Cl_2$.	5.80534, 15.°		
[2] Chromic chloride.	$Cr_2 Cl_6$.	3.03, 17.° Cryst.		
[3] Ferrous "	$Fe Cl_2$.	2.528.		
[4] Nickelous "	$Ni Cl_2$.	2.56.		
[5] Cobaltous "	$Co Cl_2$.	2.937. m. of 3.		
[6] Cuprous "	Cu Cl.	3.6777.		
[7] " "	"	3.376.		
[8] Cupric "	$Cu Cl_2$.	3.054.		
[9] Platinous "	$Pt Cl_2$.	5.8696, 11.°		
[10] Tungsten hex chloride.	$W Cl_6$.			218.°
[11] Zinc chloride.	$Zn Cl_2$.	2.753, 13.°		
[12] Magnesium chloride.	$Mg Cl_2$.	2.177. m. of 2.		
[13] Cadmium "	$Cd Cl_2$.	3.6254, 12.°		
[14] Mercurous "	Hg Cl.	7.1758.		
[15] " "	"	7.14.		
[16] " "	"	6.9925.		
[17] " "	"	6.7107.		
[18] " "	"	6.482, Native.		
[19] " "	"	7.178.		
[20] " "	"	6.56.		
[21] Mercuric "	$Hg Cl_2$.	5.14.		
[22] " "	"	5.1398.		
[23] " "	"	5.42.		
[24] " "	"	5.4032.		
[25] " "	"		295.°	265.
[26] " "	"	6.223.		
[27] " "	"	5.448. m. of 3.		
[28] Nitrogen trichloride.	$N Cl_3$. (?)	1.653. 1.		
[29] Boron "	$B Cl_3$.	1.35. 1.	17.° 760 m. m.	
[30] Phosphorus "	$P Cl_3$.	1.45. 1.		
[31] " "	"	1.61616, 0.° 1.	78°34. 751.5m.m	
[32] " "	"	1.	78.° 763 m. m.	
[33] " "	"	1.	78°5. 760 m. m.	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Phosphorus trichloride.	$P Cl_3$.	l.	73°8. 760 m. m.	
[2]	" "	"	1.6119,0.° m. of 2.	76.° 760m. m.	
[3]	" "	"	1.59708, 10.°		
[4]	" "	"	1.47124, 76.°m. of 3.		
[5]	" "	"	1.5774, 20.°	76.° 745.9 m. m.	
[6]	" pentachloride.	$P Cl_5$.		148.°	
[7]	Vanadium dichloride.	$V Cl_2$.	3.23, 18.° s.		
[8]	" trichloride.	$V Cl_3$.	3.00, 18.° s.		
[9]	" tetrachloride	$V Cl_4$.	l. 1.8584, 0.°	154.° 760 m. m.	
[10]	" "	"	l. 1.8363, 8.°		
[11]	" "	"	l. 1.8159, 32°.		
[12]	Arsenic trichloride.	$As Cl_3$.		132.°	
[13]	" "	" l.	2.20495, 0.°	133°81. 756.9 m. m.	
[14]	" "	" l.	2.1766.		
[15]	" "	" l.	2.1668, 20.°	128.° 754 m. m.	
[16]	Antimony "	$Sb Cl_3$.		198.°	
[17]	" "	"		230.°	72.°
[18]	" "	" l.	2.675, 73.° 2.	223.° 760 m. m.	73°2.
[19]	" pentachloride.	$Sb Cl_5$.	2.3461. 20.°		
[20]	Bismuth trichloride.	$Bi Cl_3$.	4.56, 11.°		
[21]	Carbon dichloride.	$C_2 Cl_4$.	1.619, 20.°	122.°	
[22]	" "	"	1.649, 0.°	123.9. 761.9 m.m	
[23]	" "	"	1.612, 10.°	116°7.	
[24]	" trichloride.	$C_2 Cl_6$.	2.0.	182.°	160.
[25]	" tetrachloride.	$C Cl_4$.	1.599.	78.°	
[26]	" "	"	1.56.	77.°	
[27]	" "	"	1.62983, 0.°	78°1. 748.3 m.m	
[28]	" "	"	1.567, 12.°	77.°	
[29]	" "	"	1.5947, 20.°	75°5. 739.4 m.m	
[30]	Silicon trichloride.	$Si_2 Cl_6$.	1.58, 0.°	146.°–148.°	
[31]	" tetrachloride.	$Si Cl_4$.		50.°	
[32]	" "	"	1.52371, 0.°	59.° 760 m. m.	
[33]	" "	"	1.4878, 20.°	58.° 756 m. m.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Silicon tetrachloride.	$Si Cl_4$.	1.4928, 15.°		
[2] " "	"	1.49276.		
[3] " "	"	1.50068, 10.° 98.		
[4] " "	"	1.522, 0.°		
[5] Titanium "	$Ti Cl_4$.	1.76088, 0.°	136.° 762.3 m.m	
[6] " "	"		135.°	
[7] Tin protochloride.	$Sn Cl_2$.			250.°
[8] " tetrachloride.	$Sn Cl_4$.	2.26712, 0.°	115°.4. 753.1 m.m	
[9] " "	"		120.° 767 m.m.	
[10] " "	"		112°.5. 752 m.m.	
[11] " "	"	2.234, 15.°		
[12] " "	"	2.2328, 20.°	162.° 754.9 m.m	
[13] Aluminic chloride.	$Al_2 Cl_6$.			180.°
[14] Niobic "	$Nb Cl_5$.		240°.5.	194.°
[15] Tantalic "	$Ta Cl_5$.		241°.6. 753 m.m.	211.° 3.
[16] Tungsten pentachloride.	$W Cl_5$.		275°.6.	248.°–242.°
[17] " hexchloride.	$W Cl_6$.		346°.7.	275.°–270.°

2d. HYDRATED SIMPLE CHLORIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18] Calcium chloride.	$Ca Cl_2 . 6 H_2 O$.	1.680. m. of 2.		
[19] " "	"	1.635.		
[20] " "	"	1.612, 10.°		29.°
[21] Strontium "	$Sr Cl_2 . 6 H_2 O$.	2.015. m. of 2.		
[22] " "	"	1.603.		
[23] " "	"	1.921.		
[24] Barium "	$Ba Cl_2 . 2 H_2 O$.	3.144. m. of 2.		
[25] " "	"	2.664.		
[26] " "	"	3.05435, 4.°		
[27] " "	"	3.052.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Barium chloride.	$Ba Cl_2. 2 H_2 O$	3.081.		
[2] Manganous chloride.	$Mn Cl_2. 4 H_2 O.$		106.°	87°5.
[3] Manganous chloride.	$Mn Cl_2. 4 H_2 O.$	2.01, 10.°		
[4] Ferrous «	$Fe Cl_2. 4 H_2 O.$	1.926.		
[5] « «	«	1.937.		
[6] Cobaltous «	$Co Cl_2. 6 H_2 O.$	1.84. 13.°		
[7] Cupric «	$Cu Cl_2. 2 H_2 O.$	2.535. m.of 2.		
[8] « «	«	2.47, 18.°		
[9] Magnesium «	$Mg Cl_2. 6 H_2 O.$	1.562. m.of 4.		
[10] « «	«	1.558.		
[11] Stannous «	$Sn Cl_2. 2 H_2 O.$	2.759. s.		
[12] « «	«	2.71. 15°5. s.		
[13] « «	«	2.5876, 37°7.1		
[14] « «	$Sn Cl_2. 4 H_2 O.$			50.°
[15] Platinic «	$Pt Cl_4. 8 H_2 O.$	2.431, 15.°		

3d. ANHYDROUS DOUBLE CHLORIDES.

Excluding Compounds of Oxychlorides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Potassium zinc chloride.	$2 K Cl. Zn Cl_2.$	2.297.		
[17] Ammonium zinc chloride.	$2 N H_4 Cl. Zn Cl_2.$	1.879.		
[18] « « «	«	1.72–1.77, 10°		
[19] Potassium platinchloride.	$2 K Cl. Pt Cl_4.$	3.586, 15.°		
[20] « «	«	3.694.		
[21] Ammonium «	$2 N H_4 Cl. Pt Cl_4.$	2.955.		
[22] « «	«	3.009. } 15.°		
[23] « «	«	2.960.		
[24] Potassium iridochloride.	$2 K Cl. Ir Cl_4.$	3.546, 15.°		
[25] Ammonium «	$2 N H_4 Cl. Ir Cl_4.$	2.856, 15.°		
[26] Caesium stannochloride.	$2 Cs Cl. Sn Cl_4.$	3.3308, 20.° 5.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium aluminum chloride.	$2\,Na\,Cl.\,Al_2\,Cl_6$.			185.°
[2] Selenium phosphorus "	$Se\,Cl_4.\,2\,P\,Cl_5$.		220.°	
[3] Iron " "	$Fe_2\,Cl_6.\,2\,P\,Cl_5$.		280°+.	98.°
[4] Aluminum " "	$Al_2\,Cl_6.\,2\,P\,Cl_5$.		400.°	
[5] Silicohydric "	$Si_3\,H_4\,Cl_{10}$.	1.65.	42.°	

4th. HYDRATED DOUBLE CHLORIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[6] Potassium iron chloride.	$2\,K\,Cl.\,Fe\,Cl_2.\,2\,H_2\,O$.	2.162.		
[7] " copper "	$2\,K\,Cl.\,Cu\,Cl_2.\,2\,H_2\,O$.	2.426.		
[8] " " "	"	2.400.		
[9] " " "	"	2.359.		
[10] " " "	"	2.410.		
[11] Ammonium " "	$2\,N\,H_4\,Cl.\,Cu\,Cl_2.\,2\,H_2\,O$.	2.018.		
[12] " " "	"	1.963.		
[13] " " "	"	1.977.		
[14] " " "	"	2.066.		
[15] " magnesium "	$N\,H_4\,Cl.\,Mg\,Cl_2.\,6\,H_2\,O$.	1.456, 10.°		
[16] Sodium mercury "	$Na\,Cl.\,Hg\,Cl_2.\,2\,H_2\,O$.	3.011.		
[17] Potassium " "	$K\,Cl.\,Hg\,Cl_2.\,H_2\,O$.	3.735.m.of 3.		
[18] Ammonium " "	$2\,N\,H_4\,Cl.\,2\,Hg\,Cl_2.\,H_2O$.	3.822.		
[19] " " "	$2\,N\,H_4\,Cl.\,Hg\,Cl_2.\,H_2\,O$.	2.938.		
[20] Potassium tin "	$2\,K\,Cl.\,Sn\,Cl_2\,3\,H_2\,O$.	2.514.		
[21] Ammonium tin "	$2\,N\,H_4\,Cl.\,Sn\,Cl_2.\,3\,H_2\,O$.	2.104.		

5th. OXY- AND SULPHO-CHLORIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[22] Thionyl chloride.	$S\,O\,Cl_2$.		82.°	
[23] " "	"	1.675, 0.°	78.°	
[24] Chlorosulphuric acid.	$S_2\,O_5\,Cl_2$.	1.818, 16.°	145.°	
[25] " "	"	1.762.	145°–150.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Selenyl chloride.	Se O Cl_2.	2.44.	220.° [m.m.	
[2] " "	"	2.443, 13.°	179°5. 760.	10.° rs, 0.°
[3] Chlorochromic acid.	Cr O_2 Cl_2.	1.9134, 10.°	[m.m.	
[4] " "	"	1.71, 21.°	118° 760	
[5] " "	"	1.92, 25.°	116°8. 733	
[6] Tungsten oxychloride.	W O Cl_4		227°5. [m.m.	210°4. s. 206°7.
[For native mineral oxychlorides. See Table of Miscellaneous Compounds.]				
[7] Nitrosyl chloride.	N O_2 Cl.	1.32, 14.°		
[8] Phosphorus oxychloride	P O Cl_3.	1.673, 14.°	110.°	
[9] " "	"	1.70, 12.°	110.°	
[10] " "	"	1.662, 19.°5. [of 2.		
[11] " "	"	1.69371, 10.° m.		
[12] " "	"	1.69106, 14.°		
[13] " "	"	1.68626, 15.°	110.°	
[14] " "	"	1.64945, 51.°	760 m.m	
[15] " "	"	1.509116, 110.°		
[16] " "	"	1.66. [m. of 5.	110.°	
[17] Vanadyl dichloride. s.	V O Cl_2.	2.88. 13.° s.		
[18] " trichloride.	V O Cl_3.	1.764, 20.°	127.°	
[19] " "	"	1.841, 14.° 5.		
[20] " "	"	1.836, 17.° 5.	126.° 7.	
[21] " "	"	1.828, 24.°	760 m. m.	
[22] Carbon oxychloride.	C O Cl_2.	1.432, 0.°	8°2.	
[23] " "	"	1.392, 18.° 6.	756.4 m.m.	
[24] Silicon "	Si_2 O Cl_6.		136°–139.°	
[25] Phosphorus sulphochloride.	P S Cl_3.		126°–127.°	
[26] " "	"		126°–127.°	
[27] " "	"	1.631, 22.°	124°–125.°	
[28] Carbon "	C S Cl_2.	1.46.	70.°	
[29] Silicon "	$Si_3S_2Cl_6$(?)	1.45, 15.°	a. 100.°	

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6th. AMMONIO-CHLORIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pupureo cobalt chloride.	$10\,N\,H_3.\,Co_2\,Cl_6$.	1.802, 23.°		
[2] Luteo cobalt "	$12\,N\,H_3.\,Co_2\,Cl_6$.	1.7016, 20.°		
[3] Copper ammonio " 1st.	$Cu\,Cl_2.\,2\,N\,H_3$.	2.194.		
[4] " " " 2d.	$Cu\,Cl_2.\,4\,N\,H_3.\,H_2O$.	1.672.		
[5] Mercury " "	$Hg\,Cl_2.\,N\,H_3$.		590.°	
[6] Dimercurosammonium chloride.	$(Hg_2\,N\,H_2)\,Cl$.	6.858. m.of 2		
[7] Dimercurammonium chloride.	$Hg_2\,N_2\,H_4\,Cl_2$.	5.700.		
[8] (?)	$Hg_4\,N_2\,Cl_2.\,2\,H_2O$.	7.176. m.of 2		

IV. Inorganic Bromides.

1st. SIMPLE BROMIDES. ANHYDROUS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[9] Hydrogen bromide.	H Br.			s.—87.°
[10] Sodium "	Na Br.	2.952.		
[11] " "	"	3.079, 17.° 5.		
[12] " "	"	3.011.		
[13] Potassium "	K Br.	2.415.		
[14] " "	"	2.672.		
[15] " "	"	2.690. m. of 6.		
[16] Ammonium "	$N\,H_4$ Br.	2.379.		
[17] " "	"	2.266. 10.°		
[18] Silver "	Ag Br.	6.3534.		
[19] " "	"	6.425. m. of 7.		
[20] " "	"	5.8–6.02, Native.		
[21] Selenium "	Se Br.	3.604, 15.°		

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[20] Berthier. See 23, or 27.
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Calcium bromide.	$CaBr_2$.	3.32, 11.		
[2] Strontium "	$SrBr_2$.	3.962. 12.°		
[3] Barium "	$BaBr_2$.	4.23.		
[4] Lead "	$PbBr_2$.	6.6302.		
[5] " "	"	6.611, 17°5.		
[6] Cuprous "	Cu Br.	4.72, 12.°		
[7] Zinc "	$ZnBr_2$.	3.643, 10.°		
[8] Cadmium "	$CdBr_2$.	4.712. } 14.°		
[9] " "	"	4.910. }		
[10] Mercurous "	Hg Br.	7.307.		
[11] Mercuric "	$HgBr_2$.	5.9202.		
[12] " "	"			222°–223.°
[13] Boron tribromide.	BBr_3.	2.69. l.	90°5.	
[14] Phosphorus "	PBr_3.	2.92489, 0.° l.	175°3. 760.2m.m.	
[15] " "	"		167.°	
[16] Arsenic "	$AsBr_3$.		220.°	20°–25.°
[17] " "	"	3.66, 15.°		
[18] Antimony "	$SbBr_3$.		270.°	94.°
[19] " "	"	3.641, 90.° l.	275°4. 760 m. m.	90.°
[20] Bismuth "	$BiBr_3$.			200.°
[21] " "	"	5.6041.		
[22] Carbon dibromide.	C_2Br_4.			50.°
[23] Carbon tetrabromide.	CBr_4.			91.°
[24] Silicon "	$SiBr_4$.	l. 2.8128, 0.°	153°36. 762.3m.m.	
[25] " "	"		148°–150.°	s–12°to–15.°
[26] Titanium "	$TiBr_4$.	2.6.	230.°	39.°
[27] Tin "	$SnBr_4$.	3.322, 39.° l.		
[28] Aluminium bromide.	Al_2Br_6.		265°–270.°	90.°
[29] " "	"	2.54.	260.°	93.°

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2d. HYDRATED, DOUBLE, OXY-, AND SULPHO-BROMIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium bromide.	$Na\ Br.\ 4\,H_2\,O.$	2.34.		
[2] Barium "	$Ba\ Br_2.\ 3\,H_2\,O.$	3.690.		
[3] Ammonium zinc bromide.	$2\,N\,H_4\,Br.\ Zn\ Br_2.$	2.625, 13.°		
[4] Potassium platin—bromide.	$2\,K\ Br.\ Pt\ Br_3.$	4.68, 14.°		
[5] Silicohydric bromide.	$Si_3\,H_4\,Br_{10}.$	a. 2.5.		
[6] Phosphorus oxybromide.	$P\,O\,Br_3.$	2.822. s. or l.(?)	195.°	45°–46.°
[7] " "	"		193.°	55.°
[8] Vanadyl bromide.	$V\,O\,Br_3.$	2.9673, 0.° } l.	130°–136.°	
[9] " "	"	2.9325, 14°5 }		
[10] Phosphorus sulphobromide.	$P\,S\,Br_3.$	2.72.	215.°	39.°
[11] " "	"	2.85, 17.°		
[12] " "	$P\,S\,Br_3.\ H_2\,O.$	2.7937, 18.°		35.°

V. Inorganic Iodides.

1st. SIMPLE ANHYDROUS IODIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Hydrogen iodide.	H I.			s.—51.°
[14] Sodium "	Na I.	3.450.		
[15] Potassium "	K I.	3.078–3.104.		
[16] " "	"	2.9084.		
[17] " "	"	3.059.		
[18] " "	"	3.056.		
[19] " "	"	2.850.		
[20] " "	"	2.970.		

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[16] Karsten. 3.
[17] Playfair and Joule. 11.
[18] Filhol. 12.
[19] Schiff. 21.
[20] Buignet. 14.15.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Potassium iodide.	K I.	3.081–3.077.		
[2]	Ammonium "	$N H_4$ I.	2.498, 11.°		
[3]	Silver "	Ag I.	5.64–5.67.		
[4]	" "	"	5.504.		
[5]	" "	"	5.707. Iodyrite.		
[6]	" "	"	5.614.		
[7]	" "	"	5.0262.		
[8]	" "	"	5.500.		
[9]	" "	"	5.366. Native.		
[10]	" "	"	5.35.		
[11]	" "	"	5.650.		
[12]	" "	"	5.718.		
[13]	" "	"	5.47. 0.°		
[14]	" "	"	5.544. Cryst.		
[15]	" "	"	5.687. After fusion.		
[16]	" "	"	5.807. 0.° Precip.		
[17]	Strontium "	Sr I_2.	4.415, 10.°		
[18]	Barium "	Ba I_2.	4.917.		
[19]	Lead "	Pb I_2.	6.11.		
[20]	" "	"	6.0212.		
[21]	" "	"	6.384.		
[22]	" "	"	6.07.		
[23]	" "	"	6.207.		
[24]	Cuprous iodide.	Cu I.	4.410.		
[25]	Zinc "	Zn I_2.	4.696, 10.°		
[26]	Cadmium "	Cd I_2.	4.576, 10.°		
[27]	Mercurous "	Hg I.	7.75.		
[28]	" "	"	7.6445.		
[29]	Mercuric "	Hg I_2.	6.32.		
[30]	" "	"	6.2009.		
[31]	" "	"	6.250.		
[32]	" "	"	5.91.		
[33]	" "	"	6.27.		

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[24] Schiff. 21.
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[26] Bödeker. 26.
[27] Boullay. 2.
[28] Karsten. 3.
[29] Boullay. 2.
[30] Karsten. 3.
[31] Filhol. 12.
[32] Schiff. 21.
[33] Tschermak. 27.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Mercuic iodide.	$Hg\ I_2$.			238.°
[2] Phosphorus diiodide.	$P\ I_2$.			a 110.°
[3] " tri iodide.	$P\ I_3$.			55.°
[4] Arsenic "	$As\ I_3$.	4.39, 13.°		
[5] Antimony "	$Sb\ I_3$.	5.01, 10.°		
[6] Bismuth "	$Bi\ I_3$.	5.652, 10.°		
[7] Silicon tetriodide.	$Si\ I_4$.		290.°	120. 5.
[8] Titanium "	$Ti\ I_4$.		360.°+	150.°
[9] Tin "	$Sn\ I_4$.		295.°	146.° s. 142.°
[10] " "	"	4.696, 11.°		
[11] Aluminum iodide.	$Al_2\ I_6$.			a. 185.°
[12] " "	"	2.63.	350.°	125.°

2d. HYDRATED AND DOUBLE IODIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Ferrous iodide.	$Fe\ I_2.\ 4\ H_2\ O.$	2.873, 12.°		
[14] Potassium platiniodide.	$2\ K\ I.\ Pt\ I_4.$	5.154. } 12.°		
[15] " "	"	5.198. }		

VI. CHLOROBROMIDES, CHLORIDES, AND BROMIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Carbon chlorobromide.	$C_2\ Cl_4\ Br_2$.	2.3, 21.°		
[17] Silicon "	$Si\ Cl_3\ Br$.		80.°	
[18] Phosphorus oxychlorobromide.	$P\ O\ Cl_2\ Br$.	2.059, 0.°	135.°–137.°	
[19] Mercury bromiodide.	$Hg\ I\ Br$.			229.°

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VII. Oxides.

1st. SIMPLE OXIDES.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Water.*	H_2O.	1.000, 4.°	100.°	0.°
[2]	"	"	.999889, +, 0.°		
[3]	"	"	.988433+, 50.°		
[4]	"	"	.958737+, 100.°		
[5]	"	"	.999887, 0.°		
[6]	"	"	.992247, 40.°		
[7]	"	"	.999862, 0.°		
[8]	"	"	.99988, 0.°		
[9]	"	"	.95903, 99°8.		
[10]	"	"	.93078, 130°8.		
[11]	"	"	.93123, 131.°		
[12]	"	"	.93035, 131°1.		
[13]	"	"	.90811,		
[14]	"	"	.90783, 156°7.		
[15]	"	"	.90715, 157.°		
[16]	"	"	.95892, 100.°		
[17]	"	"	.999866, 0.°		
[18]	"	"	.98835, 50.°		
[19]	Ice.*	"	.91812,—1.°		
[20]	"	"	.91912,—10.°		
[21]	"	"	.92025,—20.°		
[22]	"	"	.9184, m. of 2.		
[23]	"	"	See 11.		
[24]	"	"			
[25]	"	"	.9175. m. of 22.		
[26]	"	"	.918.		
[27]	"	"	.922.		

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*In dealing with water and ice the compiler has not sought for completeness. Only the more prominent of a vast number of determinations are here given.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hydrogen peroxide.	H_2O_2.	1.452.		
[2] Chlorine trioxide. l.	Cl_2O_3.	1.3298. } 0.°	8° to 9.°	
[3] " " l.	"	1.387. }	745 m. m.	
[4] Iodine pentoxide.	I_2O_5.	4.250.		
[5] " "	"	4.7987, 9.°		
[6] " "	"	4.487, 0.°		
[7] Sodium oxide.	Na_2O.	2.805.		
[8] Potassium oxide.	K_2O.	2.656.		
[9] Silver "	Ag_2O.	7.143, 16°6.		
[10] " "	"	7.250.		
[11] " "	"	8.2558.		
[12] " "	"	7.147.		
[13] " peroxide.	Ag_2O_2.	5.474. Impure.		
[14] Sulphurous acid. l.	SO_2.	1.42.	—10.°	
[15] " " l.	"	1.45.		
[16] " " l.	"		—10°5.	
[17] " " l.	"			s—76.°
[18] " " l.	"	1.4911,—20°5.	—8°759.2m.m.	
[19] " "	"	1.4609,—9°9.		
[20] " "	"	1.4384,—2°08.		
[21] " "	"	1.4318,—0°25.		
[22] " "	"	1.4252,+2°8.		
[23] " "	"	1.4205, 4°51.		
[24] " "	"	1.4102, 8°27.		
[25] " "	"	1.4017, 11°5.		
[26] " " l.	"	1.3887, 16°43.		
[27] " "	"	1.3769, 20°63.		
[28] " "	"	1.3673, 23°91.		
[29] " "	"	1.3587, 26°9.		
[30] " "	"	1.3513, 29°57.		
[31] " "	"	1.3415, 32°96.		
[32] " "	"	1.3350, 35°29.		
[33] " "	"	1.3258, 38°65.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sulphuric acid.	$S O_3$.	1.9546, 13.° s.		
[2] " "	"	1.975. s.		
[3] " "	"	1.97, 20.° l.		a 25.°
[4] " "	"	1.92118.		
[5] " "	"	1.90915. 25.°		
[6] " "	"	1.90814. s.	46°–47.°	29°5.
[7] " "	"	1.81958.	760 m. m.	rs. 25°
[8] " "	"	1.8105. 47.°		
[9] " "	"	1.8101. l.		
[10] " "	"		46.°	
[11] Tellurium dioxide.	$Te O_2$.	5.93, 20.°		
[12] Calcium oxide.	Ca O.	3.179.		
[13] " "	"	3.16105.		
[14] " "	"	3.180.		
[15] Strontium oxide.	Sr O.	3.9321.		
[16] " "	"	4.611.		
[17] Barium "	Ba O.	4.0.		
[18] " "	"	4.7322.		
[19] " "	"	4.829—4.986.		
[20] " "	"	5.456.		
[21] " peroxide.	$Ba O_2$.	4.958.		
[22] Lead suboxide.	$Pb_2 O$.	9.772.		
[23] " monoxide.	Pb O.	9.277. 17°5.		
[24] " "	"	9.5.		
[25] " "	"	9.2092.		
[26] " "	"	9.250.		
[27] " "	"	9.361.		
[28] " "	"	9.3634, 4.°		
[29] " "	"	8.02. Cryst.		
[30] " "	"	9.2–9.36. Native.		
[31] " dioxide.	$Pb O_2$.	8.902. 16°5.		
[32] " "	"	8.933.		
[33] " "	"	8.897–8.756.		
[34] " Minium.	$Pb_3 O_4$.	8.94.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Minium.	$Pb_3 O_4$.	9.096. 15.°		
[2] "	"	9.190.		
[3] "	"	8.62.		
[The oxides of the iron and allied groups are arranged according to similarity of formula.]				
[4] Manganous oxide.	Mn O.	4.7264. 17.°		
[5] " "	"	5.38.		
[6] " "	"	5.091.		
[7] Nickelous "	Ni O.	5.597.		
[8] " "	"	5.745. Furnace product.		
[9] " "	"	6.605. Cryst.		
[10] " "	"	6.398.		
[11] " "	"	6.661.		
[12] " "	"	6.8. Artif. cryst.		
[13] " "	"	6.398. Bunsenite.		
[14] Cobaltous "	Co O.	5.597.		
[15] " "	"	5.75. After ignition.		
[16] Uranous "	U O.	10.15.		
[17] Cupric "	Cu O.	6.401. 16°5.		
[18] " "	"	6.130.		
[19] " "	"	6.4304.		
[20] " "	"	5.90.		
[21] " "	"	6.414. After ignition.		
[22] " "	"	6.322.		
[23] " "	"	6.451. Cryst. furnace product.		
[24] " "	"	6.25. Melaconite.		
[25] " "	"	5.952. "		
[26] Sesquioxides.	$R_2 O_3$.			
[27] Chromic oxide.	$Cr_2 O_3$.	5.21. Cryst.		
[28] " "	"	4.909.		
[29] " "	"	6.2. Cryst.		

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[10] Bergemann. 11.683.
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[22] Filhol. 12.
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[24] Whitney. 2.728.
[25] Joy.
[27] Wöhler. Watts' Dictionary.
[28] Playfair and Joule. 11.
[29] Schiff. 11.161.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Chromic oxide.	$Cr_2 O_3$.	5.010.		
[2]	Manganic «	$Mn_2 O_3$.	4.82. Braunite.		
[3]	« «	«	4.619. } Artificial.		
[4]	« «	«	4.568. }		
[5]	« «	«	4.325. Artificial. }		
[6]	« «	«	4.752. Braunite. }		
[7]	Ferric «	$Fe_2 O_3$.	5.251.		
[8]	« «	«	5.261. Natural.		
[9]	« «	«	5.121, 12°5. Natural.		
[10]	« «	«	4.959, 16°5. Precip.		
[11]	« «	«	5.225.		
[12]	« «	«	4.679. }		
[13]	« «	«	5.135. Ignited. }		
[14]	« «	«	5.241. } Native.		
[15]	« «	«	5.283. }		
[16]	« «	«	5.191. } Native.		
[17]	« «	«	5.214. } From three		
[18]	« «	«	5.230. } localities.		
[19]	« «	«	5.169. Precip. }		
[20]	« «	«	5.037. Ignited. }		
[21]	Nickelic «	$Ni_2 O_3$.	4.814.		
[22]	« «	«	4.846, 16°5.		
[23]	Cobaltic «	$Co_2 O_3$.	5.322, 16°5.		
[24]	« «	«	5.60.		
[25]	« «	«	4.814.		
[26]	Aluminic «	$Al_2 O_3$.	4.152, 4.°		
[27]	« «	«	3.944.		
[28]	« «	«	4.004.		
[29]	« «	«	3.531. Ruby.		
[30]	« «	«	3.562. Sapphire.		
[31]	« «	«	4.154.		
[32]	« «	«	3.928. Artif. cryst.		
[33]	« «	«	4.022. Corundum. }		
[34]	« «	«	3.992. Above, after fusion. }		

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[7] Mohs. } See 23.
[8] Breithaupt. }
[9] Kopp. See. 23.
[10] Herapath. 1.
[11] Boullay. 2.
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[13] Playfair and Joule. 11.
[14] Rammelsberg. } See 23.
[15] Rammelsberg. }
[16] G. Rose. } See 23.
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[26] Royer and Dumas } See paper by H. Rose. P. A. 47.429.
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[28] Breithaupt. }
[29] Brisson and }
[30] Muschenbroek. }
[31] Filhol. 12.
[32] Ebelmen. 4.14.
[33] Ch. St. C. Deville. See 23.
[34] Ch. St. C. Deville. See 23.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Aluminic oxide.	$Al_2 O_3$.	3.870. } Artificial.		
[2]	" "	"	3.899. }		
[3]	" "	"	3.750. } Heated in a		
[4]	" "	"	3.725. } wind furnace.		
[5]	" "	"	3.999. { Ign. in porcelain furnace.		
[6]	" "	"	3.899, 15°5. } Corundum.		
[7]	" "	"	3.929. }		
[8]	" "	"	3.974. }		
[9]	" "	"	3.9998. } Sapphire.		
[10]	" "	"	4.0001. }		
[11]	" "	"	3.994. Ruby. m. of 9.		
[12]	" "	"	4.0067, 14° Powdered.		
[13]	" "	"	3.989. } 13°5.		
[14]	" "	"	4.008. } Powder after ignition.		
[15]	Three to four oxides.	$R_3 O_4$.			
[16]	Mangano-manganic oxide.	$Mn_3 O_4$.	4.722. Hausmannite.		
[17]	" "	"	4.746. } Artif.		
[18]	" "	"	4.653. }		
[19]	" "	"	4.325. Artificial.		
[20]	" "	"	4.718. Artificial. }		
[21]	" "	"	4.856. Native. }		
[22]	Ferroso-ferric oxide.	$Fe_3 O_4$.	5.094.		
[23]	" "	"	4.960.		
[24]	" "	"	4.900—5.200.		
[25]	" "	"	5.300, 16°5.		
[26]	" "	"	5.400. }		
[27]	" "	"	5.480. }		
[28]	" "	"	5.168. } Cryst.		
[29]	" "	"	5.180. } Magnetite.		
[30]	" "	"	5.453.		
[31]	" "	"	5.12, 0.° Native.		
[32]	" "	"	5.185. } Native.		
[33]	" "	"	5.148. } From three		
[34]	" "	"	5.106. } localities.		

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[19] Playfair and Joule. 14.
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[28] Kenngott; see Dana's
[29] Mineralogy.
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[31] Kopp. See 23.
[32] Rammelsberg. See 23.
[33] Rammelsberg. See 23.
[34] Rammelsberg. See 23.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cobaltoso-cobaltic oxide.	$Co_3 O_4$.	5.833.		
[2] " " "	"	6.296.		
[3] Uranoso-uranic "	$U_3 O_4$.	7.1932.		
[4] " " "	"	7.31.		
[5] Trioxides.	R O_3.			
[6] Chromium trioxide.	Cr O_3.	2.676. m. of 2.		
[7] " "	"	2.737, 14.° Cryst.		
[8] " "	"	2.629, 14.° After fusion.		
[9] " "	"	2.819, 20.°		
[10] Molybdenum "	Mo O_3.	3.46.		
[11] " "	"	3.49.		
[12] " "	"	4.49—4.50. Native.		
[13] " "	"	4.39. 21.° m.of 2 Cryst.		
[14] Tungsten "	W O_3.	6.12.		
[15] " "	"	5.274, 16°5.		
[16] " "	"	7.1396.		
[17] " "	"	6.302.		
[18] "	"	6.384. Cryst.		
[19] " "	"	7.16. Amorphous.		
[20] " "	"	7.232, 17.° Cryst.		
[Miscellaneous oxides of the Fe. Pt. Mo. Zn. groups.]				
[21] Manganese dioxide.	Mn O_2	4.81. Pyrolusite.		
[22] " "	"	5.026. "		
[23] " "	"	4.838.		
[24] " "	"	4.880. Polianite.		
[25] " "	"	4.826. Polianite.		
[26] Cuprous oxide.	Cu_2 O.	5.75.		
[27] " "	"	6.093.		
[28] " "	"	6.052. 16°5.		
[29] " "	"	5.751.		
[30] " "	"	5.746.		
[31] " "	"	5.992. Cuprite.		

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[12] Weisbach. Dana's Mineralogy.
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[14] De Luyart. See 11.
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[29] Karsten. 3.
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ruthenium dioxide.	$Ru O_2$.	7.2.		
[2] Ruthenium tetroxide.	$Ru O_4$.		a. 100.°	58.°
[3] Molybdenum dioxide.	$Mo O_2$.	5.67.		
[4] Tungsten "	$W O_2$.	12.1109.		
[5] Zinc oxide.	Zn O.	5.432.		
[6] " "	"	5.600.		
[7] " "	"	5.7344.		
[8] " "	"	5.6067.		
[9] " "	"	5.6570.		
[10] " "	"	5.5298. Cryst.		
[11] " "	"	5.612.		
[12] " "	"	5.684. Zincite.		
[13] Cadmium oxide.	Cd O.	8.183. 16°5.		
[14] " "	"	6.9502.		
[15] " "	"	8.111.		
[16] Magnesium oxide.	Mg O.	3.674. Periclase.		
[17] " "	"	3.750. "		
[18] " "	"	3.200.		
[19] " "	"	3.644.		
[20] " "	"	3.650.		
[21] " "	"	3.636. Artif. cryst.		
[22] Mercurous "	$Hg_2 O$.	10.69. 16°5.		
[23] " "	"	8.9503.		
[24] Mercuric "	Hg O.	11.074. 17°5.		
[25] " "	"	11.085. 18°3.		
[26] " "	"	11.0.		
[27] " "	"	11.1909.		
[28] " "	"	11.29.		
[29] " "	"	11.344.		
[30] " "	"	11.136.		
[Miscellaneous oxides of unclassified metals.]				
[31] Glucinum oxide.	Gl O.	2.967.		
[32] " "	"	3.02—3.06. Cryst.		

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[15] Werther. See 23.
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[17] Scacchi. See 23.
[18] Karsten. 3.
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[26] Boullay. 2.
[27] Karsten. 3.
[28] Leroyer & Dumas. See 11.
[29] Playfair and Joule. 11.
[30] Playfair and Joule. 14.
[31] Ekeberg. P. M. (1). 14.346.
[32] Ebelmen. 4.15.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Glucinum oxide.	Gl O.	3.09—3.083. Powder.		
[2] " "	"	3.096, 12.° Precip.		
[3] " "	"	3.027, 10.° Ignited in porcelain furnace.		
[4] " "	"	3.021, 9.° Cryst.		
[5] Yttrium "	Y O.	4.842.		
[6] Ceric "	$Ce_2 O_3$.	5.6059.		
[7] " "	"	6.00.		
[8] Ceroso-diceric oxide.	$Ce_5 O_7$.	5.769.		
[9] Ceroso-ceric oxide.	$Ce_3 O_4$.	6.93—6.94. 15°5.		
[10] " " "	"	7.09, 14°5. Cryst.		
[11] Lanthanum "	La O.	5.94.		
[12] " "	"	5.296, 16.° + tr. $B_2 O_3$.		
[13] Didymium "	Di O.	6.64.		
[14] " "	"	5.825, 14.° + tr. $B_2 O_3$.		
[15] Thorium "	Th O.	9.402.		
[16] " "	"	9.21.		
[17] " "	"	9.077—9.200.		
[Nitrogen group.]				
[18] Nitrous oxide. l.	$N_2 O$.	.9756, —5.°		
[19] " " l.	"	.9370, 0.°		
[20] " " l.	"	.9177, +5.°		
[21] " " l.	"	.8964, 10.°		
[22] " " l.	"	.8704, 15.°		
[23] " " l.	"	.8365, 20.°		
[24] Hyponitric acid. l.	$N O_2$.	1.451.	28° 760 m.m	
[25] " " l.	"	1.42.	28.°	
[26] Nitrogen pentoxide.	$N_2 O_5$.		45°–50.°	29°–30.°
[27] Boron trioxide.	$B_2 O_3$.	175.		
[28] " "	"	1.803.		
[29] " "	"	1.83.		
[30] Phosphorus pentoxide.	$P_2 O_5$.	2.387.		
[31] Vanadium oxide.	$V_2 O_2$.	3.64, 20.° Supposed metal.		
[32] " trioxide.	$V_2 O_3$.	4.72, 16.° m. of 3.		

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[31] Schafarik. J. F. P. 76.142.
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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Vanadium pentoxide.	V_2O_5.	3.472. } 20.°		
[2]	" "	"	3.510. }		
[3]	Arsenic trioxide.	As_2O_3.	3.698.		
[4]	" "	"	3.690–3.710.		
[5]	" "	"	3.695. Octahedral. }		
[6]	" "	"	3.7385. Amorphous. }		
[7]	" "	"	3.729, 17°2.		
[8]	" "	"	3.7202. }		
[9]	" "	"	3.7026. }		
[10]	" "	"	3.884.		
[11]	" "	"	3.85. Native, prismatic.		
[12]	" pentoxide.	As_2O_5.	3.7342.		
[13]	" "	"	4.023. }		
[14]	" "	"	3.985. }		
[15]	" "	"	4.250.		
[16]	Antimony trioxide.	Sb_2O_3.	5.57.		
[17]	" "	"	5.778.		
[18]	" "	"	6.6952.		
[19]	" "	"	5.251.		
[20]	" "	"	5.11. Octahedral. }		
[21]	" "	"	3.72. Prismatic. }		
[22]	Senarmontite.	"	5.22–5.30.		
[23]	Valentinite.	"	5.566. Cryst.		
[24]	Antimony tetroxide.	Sb_2O_4.	4.074.		
[25]	" "	"	4.084. Cervantite.		
[26]	" pentoxide.	Sb_2O_5.	6.525.		
[27]	" "	"	3.779.		
[28]	Bismuth trioxide.	Bi_2O_3.	6.7608, 16°5. }		
[29]	" "	"	8.211, 18°3. After ignition. }		
[30]	" "	"	8.45.		
[31]	" "	"	8.1735.		
[32]	" "	"	8.079.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
	[Carbon group.]				
1	Carbon dioxide. l.	$C O_2$.	.9. —20.°		
2	« « l.	«	.83. 0.°		—73.°
3	« « l.	«	.6. +30.°		
4	« « s.	«			-56°.5 to -58°.
5	« « l.	«	.9952, —10.°		
6	« « l.	«	.9710, — 5.°		
7	« « l.	«	.9471, 0.°		
8	« « l.	«	.9222, + 5.°		
9	« « l.	«	.8948, 10.°		
10	« « l.	«	.8635, 15.°		
11	« « l.	«	.8267, 20.°		
12	« « l.	«	.7831, 25.°		
13	Silicon « Quartz.	$Si O_2$.	2.653. Cryst.		
14	« « «	«	2.6354. } Extremes of eleven		
15	« « «	«	2.6541. } determinations.		
16	« « «	«	2.653, 13.° m. of 5.		
17	« « «	«	2.653, 13.° Pulv. sandstone.		
18	« « «	«	2.656. Cryst.		
19	« « «	«	2.22. After fusion.		
20	« « Artificial.	«	2.20, 12°5. { m. of 9. Precipitate.		
21	« « Tridymite.	«	2.295. } 15°–16.°		
22	« « «	«	2.326. }		
23	« « «	«	2.282. 18°5.		
24	Titanium dioxide. Rutile	$Ti O_2$	4.249.		
25	« « «	«	4.244.		
26	« « «	«	4.250–4.291.		
27	« « «	«	4.420. 0.°		
28	« « «	«	4.26. Artificial.		
29	« « «	«	4.283. «		
30	« « «	«	4.3. «		
31	« « «	«	4.56.		
32	« « (???)	«	4.18.		
33	« « «	«	3.9311. Artif. powder.		

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22 v. Rath. 21.1001.
23 v. Rath. 21.1001.
24 Mohs.
25 Scheerer. } See 23.
26 Breithaupt. }
27 Kopp. }
28 Ebelmen. 4.15.
29 Ebelmen. 12.14.
30 Hautefeuille. 16.212.
31 Müller. 5.847.
32 Klaproth.
33 Karsten. 3.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Titanium dioxide. (???)	TiO_2.	4.253. } Powder.		
[2]	" " "	"	4.255. } Ignited.		
[3]	" " "	"	4.128.		
[4]	" " Brookite.	"	4.1. Artificial.		
[5]	" " "	"	4.128. }		
[6]	" " "	"	4.131. }		
[7]	" " "	"	4.165. }		
[8]	" " "	"	4.166. }		
[9]	" " "	"	3.81. From Ural.		
[10]	" " "	"	4.216. " "		
[11]	" " "	"	3.952. Arkansite.		
[12]	" " "	"	3.892. }		
[13]	" " "	"	3.949. }		
[14]	" " "	"	4.22.		
[15]	" " "	"	4.20.		
[16]	" " "	"	4.03–4.083. Arkansite.		
[17]	" " "	"	4.085. "		
[18]	" " Anatase.	"	3.890. }		
[19]	" " "	"	3.912. }		
[20]	" " "	"	3.857.		
[21]	" " "	"	3.75.		
[22]	" " "	"	3.826.		
[23]	" " "	"	3.82.		
[24]	" " "	"	4.06. From Brazil.		
[25]	" " "	"	3.7–3.9. Artificial.		
[26]	Tin monoxide.	Sn O.	6.666. 16°.5.		
[27]	" dioxide.	SnO_2.	6.72.		
[28]	" "	"	6.96.		
[29]	" "	"	4.933. 17°.8. }		
[30]	" "	"	6.639. 16°.5. }		
[31]	" "	"	6.90.		
[32]	" "	"	6.892–7.180.		
[33]	" "	"	6.95–6.96.		
[34]	" "	"	6.831. 0.°		

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[32] Breithaupt. } See 23.
[33] Neumann. }
[34] Kopp. }

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Tin dioxide.	$Sn O_2$	6.849–6.978.		
[2]	" "	"	6.7122, 4.°		
[3]	" "	"	6.753. Fr. Wicklow.		
[4]	" "	"	6.862. Fr. Mexico.		
[5]	" " Bolivia.	"	6.8432, 15°5. } Colorless.		
[6]	" " "	"	6.8439. }		
[7]	" " "	"	7.021, 15°5. Black.		
[8]	" " "	"	6.704, 15°5. Yellow.		
[9]	Zirconium dioxide.	$Zr O_2$.	4.35. to 4.90. } Amorphous.		
[10]	" "	"			
[11]	" "	"	5.49.		
[12]	" "	"	4.3.		
[13]	" "	"	5.42.		
[14]	" "	"	5.5.		
[15]	" "	"	4.9.		
[16]	"	"	5.742, 15.°		
[17]	"	"	5.710, 15.°		
[18]	" "	"	5.624, 15.°		
	[Miscellaneous.]				
[19]	Niobium pentoxide.	$Nb_2 O_5$.	4.56. } Extremes of several		
[20]	" "	"	5.26. } determinations.		
[21]	" "	"	6.140. } From fusion		
[22]	" "	"	6.146. } with $K_2 S_2 O_7$.		
[23]	" "	"	6.48. Above, ignited.		
[24]	" "	"	5.83. More strongly heated.		
[25]	" "	"	5.90. }		
[26]	" "	"	5.98. } From		
[27]	" "	"	5.706. } chloride.		
[28]	" "	"	6.239. }		
[29]	" "	"	6.1–6.4. Ignited.		
[30]	" "	"	6.725, "		
[31]	" "	"	5.79. More strongly heated.		
[32]	" "	"	5.51–5.52.		

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[30] H [illegible] 58.
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[32] H [illegible]

For valuable details, as to modes of preparation, characters of samples, &c., see original paper.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Niobium pentoxide.	Nb_2O_5.	4.56.) Extremes of		
[2]	" "	"	6.54.) several.		
[3]	" "	"	5.20.) 14.°		
[4]	" "	"	5.48.) Cryst.		
[5]	" "	"	4.37–4.46.) Prepared by		
[6]	" "	"	4.51–4.53.) two methods.		
[7]	" "	"	4.31.		
[8]	" "	"	5.00.		
[9]	Tantalum "	Ta_2O_5.	7.03.) Extremes of several		
[10]	" "	"	8.26.) determinations.		
[11]	" "	"	7.055.) From fusion		
[12]	" "	"	7.065.) with $K_2S_2O_7$.		
[13]	" "	"	7.986. Heated more strongly.		
[14]	" "	"	7.028–7.280. From chloride.		
[15]	" "	"	7.284. Crystalline fr. $TaCl_5$.		
[16]	" "	"	7.994. Strongly ignited.		
[17]	" "	"	7.652. More strongly heated.		
[18]	" "	"	8.257. Porcelain furnace.		
[19]	" "	"	7.00.		
[20]	" "	"	7.35. Ign. precip. from $TaCl_5$.		
[21]	" "	"	8.01. From NH_4 Salt.		
[22]	" "	"	7.60.) From K Salt.		
[23]	" "	"	7.64.)		

2d. DOUBLE OXIDES.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[24]	Sodium uranium oxide.	$Na_2O.3U_2O_3$.	6.912.		
[25]	Zinc iron oxide.	$ZnO.Fe_2O_3$.	5.132. Artif. cryst.		
[26]	Magnesium iron oxide.	$MgO\,Fe_2O_3$.	4.568.) Magnesio-		
[27]	" " "		4.654.) ferrite.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Manganese chromium oxide.	Mn O. $Cr_2 O_3$.	4.87. Artif. cryst.		
[2] Iron chromium "	Fe O. $Cr_2 O_3$.	4.321. Chromite.		
[3] " " "	"	4.498. Chromite, fr. Styria		
[4] " " "	"	4.568. Chromite, fr. Pa.		
[5] Zinc " "	Zn O. $Cr_2 O_3$.	5.309. Artif. cryst.		
[6] Iron aluminum "	Fe O. $Al_2 O_3$.	3.91–3.95. Hercynite.		
[7] Zinc " "	Zn O. $Al_2 O_3$.	4.580. Cryst.		
[8] " " "	"	4.1–4.6. Automolite.		
[9] " " "	"	4.589. Gahnite.		
[10] " " "	"	4.317. Gahnite.		
[11] " " "	"	4.89. Gahnite from Franklin.		
[12] " " "	"	4.91. Gahnite from Franklin.		
[13] Magnesium aluminum oxide.	Mg O. $Al_2 O_3$.	3.452. Artif. cryst.		
[14] " " "	"	3.48–3.52. Spinel.		
[15] " " "	"	3.523. "		
[16] " " "	"	3.575. Red spinel.		
[17] Glucinum aluminum oxide.	Gl O. $Al_2 O_3$.	3.759. Artif. cryst.		
[18] " " "	"	3.597. Chrysoberyl. From three localities.		
[19] " " "	"	3.689. Chrysoberyl. From three localities.		
[20] " " "	"	3.734. Chrysoberyl. From three localities.		
[21] " " "	"	3.835. Chrysoberyl.		
[22] " " "	"	3.644. Alexandrite.		

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VIII. Sulphides.

1st. SIMPLE SULPHIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hydrogen sulphide.	H_2S.			s.—85°5.
[2] Sodium "	Na_2S.	2.471.		
[3] Potassium "	K_2S.	2.130.		
[4] Silver "	Ag_2S.	6.8501. Artificial.		
[5] " "	"	7.31–7.36. Acanthite.		
[6] " "	"	7.164–7.236. "		
[7] " "	"	7.188–7.326. "		
[8] " "	"	7.269–7.317. Argentite		
[9] " "	"	7.02. Daleminzite.		
[10] Thallium "	Tl_2S.	8.00.		
[11] Oldhamite	CaS. Impure.	2.58.		
[12] Lead monosulphide.	Pb S.	7.220.		
[13] " "	"	7.40–7.60.		
[14] " "	"	7.587.		
[15] " "	"	7.568.		
[16] " "	"	7.5052. Artificial.		
[17] " "	"	7.539.		
[18] " "	"	6.9238. 4.° Powdered.		
[19] " "	"	7.51. From Przibram.		
[20] " sesquisulphide.	Pb_2S_3.	6.335.		
[21] Chromium "	Cr_2S_3.	4.092.		
[22] " "	"	2.79, 10.° Two preparations.		
[23] " "	"	3.77, 19.°		
[24] Manganese monosulphide.	Mn S.	3.95–4.01. Native.		
[25] " "	"	4.014.		
[26] " "	"	4.036. From Mexico.		
[27] " disulphide.	MnS_2.	3.463. Hauerite.		
[28] Iron hemisulphide.	Fe_2S.	5.80.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Iron monosulphide.	Fe S.	5.035. m. of 2. Artif.		
[2]	" "	"	4.787. Troilite.		
[3]	" "	"	4.75. "		
[4]	" "	"	4.79. Artificial.		
[5]	" "	"	4.817. Troilite.		
[6]	" disulphide.	$Fe S_2$.	5.000–5.028. Pyrite		
[7]	" "	"	5.185. Maximum of 52 det.		
[8]	" "	"	4.678. } Marcasite.		
[9]	" "	"	4.847. }		
[10]	" "	"	4.93. Pyrite.		
[11]	" sesquisulphide.	$Fe_2 S_3$.	4.246.		
[12]	" "	"	4.41.		
[13]	Complex sulphide of iron.	$Fe_8 S_9$.	4.494.		
[14]	Pyrrhotite.	$Fe_7 S_8$.	4.584. Fr. Kongsberg.		
[15]	"	"	4.546, " Bodenmais.		
[16]	"	"	4.580, " Harzburg. }		
[17]	"	"	4.564, " Mexico. }		
[18]	"	"	4.640, " Connecticut. }		
[19]	Nickel hemisulphide.	$Ni_2 S$.	6.05.		
[20]	" monosulphide.	Ni S.	4.601. Millerite.		
[21]	" "	"	5.65. "		
[22]	Cobalt "	Co S.	5.45. Syepoorite.		
[23]	" disulphide.	$Co S_2$.	4.269.		
[24]	" sesquisulphide.	$Co_2 S_3$.	4.8.		
[25]	Copper hemisulphide.	$Cu_2 S$.	5.695.		
[26]	" "	"	5.7022. Chalcocite.		
[27]	" "	"	5.792. 17°7.		
[28]	" "	"	5.9775.		
[29]	" "	"	5.71.		
[30]	" monosulphide.	Cu S.	3.8.		
[31]	" "	"	4.1634.		
[32]	" "	"	4.636. Covellite.		
[33]	Palladium hemisulphide	$Pd_2 S$.	7.303, 15.°		

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[30] Wal
[31] Ka
[32] Ze
[33] S

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Platinum monosulphide	Pt S.	8.847, 16°25.		
[2] " disulphide.	Pt S_2	7.224, 18°75.		
[3] " "	"	5.27.		
[4] " sesquisulphide.	$Pt_2 S_3$.	5.52.		
[5] Molybdenum disulphide	Mo S_2	4.59.		
[6] " " "	"	4.44–4.8. Molybdenite		
[7] Tungsten disulphide.	$W_2 S_2$	6.26, 20.°		
[8] Zinc sulphide.	Zn S.	3.9235.		
[9] " "	"	4.063. White Blende.		
[10] "	"	4.07. Blende.		
[11] " "	"	4.05. "		
[12] "	"	3.98. Wurtzite.		
[13] Cadmium sulphide.	Cd S.	4.90. Greenockite.		
[14] " "	"	4.80. "		
[15] " "	"	4.605.		
[16] " "	"	4.5. Artif. Cryst.		
[17] " "	"	4.5. Artificial.		
[18] Mercury "	Hg S.	8.998. Cinnabar.		
[19] " "	"	8.124.		
[20] " "	"	8.0602.		
[21] " "	"	8.090. Cinnabar.		
[22] " "	"	7.701. } Amorphous.		
[23] " "	"	7.748. } Natural.		
[24] " "	"	7.552. Amorph. Artif. }		
[25] Nitrogen "	N S.	2.1166, 15.°		
[26] Phosphorus monosulphide.	P S.	1.8.		
[27] " hexsulphide.	P S_6.	2.02.		
[28] Diphosphorus trisulphide.	$P_2 S_3$.			290.°
[29] Tetraphosphorus "	$P_4 S_3$.			142.°
[30] Vanadium sulphide.	$V_2 S_4$.	4.70, 21.°		
[31] Arsenic disulphide.	$As_2 S_2$.	3.5444.		
[32] " "	"	3.4–3.6. Realgar.		

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[31] Karsten. 3.
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Arsenic trisulphide.	$As_2 S_3$.	3.459.		
[2] " "	"	3.48.		
[3] " "	"	3.48.		
[4] " "	"	3.40.		
[5] Antimony "	$Sb_2 S_3$.	4.62. Stibnite.		
[6] " "	"	4.516. "		
[7] " "	"	4.7520.		
[8] " "	"	4.15. Amorphous.		
[9] " "	"	4.614, Black. } Massive.		
[10] " "	"	4.641, 16° " } Powdered		
[11] " "	"	4.280. Red.		
[12] " "	"	4.421. Precipitated.		
[13] Bismuth disulphide.	$Bi_2 S_2$.	7.29. m. of 5.		
[14] " trisulphide.	$Bi_2 S_3$.	7.591, 14°5.		
[15] " "	"	7.0001.		
[16] " "	"	7.807.		
[17] " "	"	7.16. Fr. Bolivia.		
[18] Carbon disulphide.	C S_2.	1.272.		
[19] " "	"	1.2693, 15°1.	46°6. 760 m. m.	
[20] " "	"		46°9. 753 m. m.	
[21] " "	"		46°2. 769 m. m.	
[22] " "	"	1.265.	45.°	
[23] " "	"	1.29312, 0.°	47°9. 755. 8 m.m	
[24] " "	"	1.29858, 0.° m. of 2.		
[25] " "	"	1.27904, 10.° "	46.°	
[26] " "	"	1.26652, 17.°	760 m.m.	
[27] " "	"	1.227431, 46° m.of 3.		
[28] " "	"	1.2661, 20.°	47°7. 745. 5 m.m	
[29] Tin monosulphide.	Sn S.	4.8523.		
[30] " "	"	5.267.		
[31] " "	"	4.973.		
[32] " disulphide.	Sn S_2.	4.415.		
[33] " "	"	4.600.		
[34] Thorium sulphide.	Th S.	8.29.		

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[30] Boul.
[31] Schn.

2d. SULPHARSENITES, SULPHARSENATES, SULPHANTIMONITES, AND SULPHOBISMUTHITES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Proustite.	$3\,Ag_2\,S.\,As_2\,S_3$.	5.422–5.56.		
[2] Sartorite.	$Pb\,S.\,As_2\,S_3$.	5.405.		
[3] "	"	5.393.		
[4] "	"	5.469.		
[5] Dufrenoysite.	$2\,Pb\,S.\,As_2\,S_3$.	5.5616.		
[6] "	"	5.549.		
[7] "	"	5.561.		
[8] Binnite.	$3\,Cu_2\,S.\,2\,As_2\,S_3$.	4.477.		
[9] Enargite.	$3\,Cu_2\,S.\,As_2\,S_5$.	4.362.		
[10] "	"	4.430–4.445.		
[11] "	"	4.39. Guayacanite.		
[12] "	"	4.37.		
[13] "	"	4.34.		
[14] "	"	4.43.		
[15] Miargyrite.	$Ag_2\,S.\,Sb_2\,S_3$.	5.214–5.242.		
[16] Pyrargyrite.	$3\,Ag_2\,S.\,Sb_2\,S_3$.	5.7–5.9.		
[17] Stephanite.	$5\,Ag_2\,S.\,Sb_2\,S_3$.	6.269. Fr. Przibram		
[18] Zinkenite.	$Pb\,S.\,Sb_2\,S_3$.	5.30–5.35.		
[19] Boulangerite.	$3\,Pb\,S.\,Sb_2\,S_3$.	5.75–6.00.		
[20] Meneghinite.	$4\,Pb\,S.\,Sb_2\,S_3$.	6.339–6.345.		
[21] Berthierite.	$Fe\,S.\,Sb_2\,S_3$.	4.043.		
[22] Chalcostibite.	$Cu_2\,S.\,Sb_2\,S_3$.	4.748.		
[23] "	"	5.015.		
[24] Wittichenite.	$3\,Cu_2\,S.\,Bi_2\,S_3$.	4.3.		
[For Chiviatite, Plagionite, Brongniardite, Jamesonite, Frieslebenite, Bournonite, Tennantite, &c., See Dana.]				

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[See Dana for Kobellite, Aikinite, Tetrahedrite, Geocronite, Polybasite, &c.]

3d. MISCELLANEOUS DOUBLE AND TRIPLE SULPHIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Thallium potassium sulphide.	$K_2 S. Tl_2 S_3$.	4.263.		
[2] Iron potassium "	$K_2 S. Fe_2 S_3$.	2.563.		
[3] Sodium platinum "	$Na_2 S. 3 Pt S. Pt S_2$.	6.27, 15.°		
[4] Potassium " "	$K_2 S. 3 Pt S. Pt S_2$.	6.44, 15.°		
[5] Stromeyerite.	$Ag_2 S. Cu_2 S$.	6.26.		
[6] Pentlandite.	$Ni S. 2 Fe S_2$.	4.6.		
[7] Linnæite.	$2 Co S. Co S_2$.	4.8–5.0.		
[8] Sternbergite.	$Ag_2 S. 3 Fe S. Fe S_2$.	4.215.		
[9] Chalcopyrite.	$Cu_2 S. Fe S. Fe S_2$.	4.185.		
[10] Barnhardtite.	$2 Cu_2 S. Fe S. Fe S_2$.	4.521.		
[11] Homichlin.	$3 Cu_2 S. 3 Fe S. Fe S_2$.	4.472–4.480.		
[12] Cubanite.	$Cu_2 S. Fe S. 3 Fe S_2$.	4.026–4.042.		
[13] "	"	4.169.		
[14] "	"	4.18.		
[15] Carrollite.	$Cu_2 S. Co S. Co. S_2$.	4.58.		
[16] "	"	4.85.		
[17] Gold and Silver sulphide. [For many other native sulphides, see Dana.]	$2 Au_2 S_3. 5 Ag_2 S$.	8.159.		

IX. SELENIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18] Silver selenide.	$Ag_2 Se$.	8.00.		
[19] Thallium selenide.	$Tl_2 Se$.			340.°
[20] Lead "	Pb Se.	6.8. Native.		
[21] " "	"	7.6–8.8.		
[22] " "	"	8.154.		
[23] Iron sesquiselenide.	$Fe_2 Se_3$.	6.38.		

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[14] Sm[illegible]
[15] Fe[illegible]
[16] S[illegible] [illegible]
[17] Mu[illegible] [illegible] C. 18. 222
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[19] K[illegible] 255.
[20] Z[illegible] [illegible] 274.
[21] [illegible] [illegible]v.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Nickel selenide.	Ni Se.	8.462.		
[2] Cobalt "	Co Se.	7.647.		
[3] Copper "	Cu Se.	6.655.		
[4] Cadmium "	Cd Se.	8.789.		
[5] Mercurous "	Hg_2 Se.	8.877.		
[6] Mercuric "	Hg Se.	7.274. From Tilkerode.		
[7] " "	"	7.1–7.37. " Clausthal.		
[8] Arsenic triselenide.	As_2 Se_3.	4.752.		
[9] Bismuth "	Bi_2 Se_3.	6.82.		
[10] " "	"	7.406.		
[11] Tin monoselenide.	Sn Se.	5.24. 15.°		
[12] " diselenide.	Sn Se_2.	5.133.		
[13] " "	"	4.85.		

X. TELLURIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Silver telluride.	Ag_2 Te.	8.565.		
[15] " "	"	8.412.		
[16] Lead "	Pb Te.	8.159.		
[17] Antimony tritelluride.	Sb_2 Te_3.	6.47–6.51. 13.°		
[18] Bismuth "	Bi_2 Te_3.	7.237.		
[19] " "	"	7.868.		
[20] " "	"	7.941.		
[21] " "	"	7.642, 18.°		

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XI. Phosphides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Silver sesquiphosphide.	$Ag_2 P_3$.	4.63.		
[2] Chromium phosphide.	Cr P.	4.68.		
[3] Manganese "	$Mn_5 P_2$.	5.951. A mixture?		
[4] " "	Mn_3 P.	4.94.		
[5] Iron "	$Fe_3 P_4$.	5.04.		
[6] " "	Fe_3 P.	6.28.		
[7] Nickel "	$Ni_3 P_2$.	5.99.		
[8] Cobalt "	$Co_3 P_2$.	5.62.		
[9] Copper "	Cu_3 P.	6.75.		
[10] " "	"	6.59.		
[11] Palladium "	Pd P_2.	8.25.		
[12] Platinum "	Pt P_2.	8.77.		
[13] Molybdenum "	Mo P.	6.167.		
[14] Tungsten "	W_2 P.	5.207.		
[15] Zinc "	$Zn_3 P_2$.	4.76.		
[16] Gold sesquiphosphide.	$Au_2 P_3$.	6.67.		
[17] Tin monophosphide.	Sn P.	6.56.		

XII. Arsenides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18] Kaneite.	Mn As.	5.55.		
[19] Leucopyrite.	Fe As_2.	6.80. Fr. Andreasberg.		
[20] "	"	7.09. " Fossum.		
[21] "	"	7.282. From Breitenbrunn.		
[22] "	"	7.259. From Breitenbrunn.		
[23] "	"	8.67. From Schladming.		
[24] "	"	8.71. From Schladming.		
[25] "	"	6.659–6.848.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lölingite.	Fe As. Fe As_2.	7.00–7.228.		
[2] "	"	6.246. In mass.		
[3] "	"	6.321. Powdered.		
[4] Niccolite.	Ni As.	6.671–7.330.		
[5] Rammelsbergite.	Ni As_2.	7.099–7.188.		
[6] Smaltite.	Co As_2.	6.84.		
[7] Skutterudite.	Co As_3.	6.78.		
[8] Whitneyite.	Cu_9 As.	8.408.		
[9] "	"	8.57–8.69.		
[10] "	"	8.246–8.471, 21.°		
[11] Domeykite.	Cu_3 As.	7.75.		
[12] Algodonite.	Cu_6 As.	7.62. Fr. Chili.		
[13] "	"	6.902.		
[14] Allemontite.	Sb As_3.	6.13.		
[15] "	"	6.203.		
[16] Tin arsenide	Sn_2 As.	7.001, 18.°		
[See Dana for fuller information upon arsenides.]				

XIII. Antimonides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[17] Breithauptite.	Ni Sb.	7.541.		
[18] Tin antimonide.	Sn_2 Sb.	7.07, 19°.		
[See also tables for alloys.]				
[Dana's Mineralogy gives determinations for Dyscrasite, &c.]				

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XIV. Sulphides with Oxides, Arsenides, or Antimonides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Voltzite.	4 Zn S. Zn O.	3.5–3.8.		
[2] Kermesite.	$2Sb_2S_3.Sb_2O_3$.	4.5–4.6.		
[3] Mispickel.	$FeS_2.FeAs_2$.	6.269.		
[4] "	"	5.896–5.893.		
[5] "	"	6.21		
[6] "	"	5.821–6.086.		
[7] "	"	5.36–5.66.		
[8] "	"	6.095. In mass.		
[9] "	"	6.004. Powdered.		
[10] "	"	6.255.		
[11] Gersdorffite.	$NiS_2.NiAs_2$.	5.65–5.49.		
[12] Cobaltite.	$CoS_2.CoAs_2$.	6.0–6.3.		
[13] Pacite.	$FeS_2.4FeAs_2$.	6.297–6.303.		
[14] Ullmannite.	$NiS_2.NiSb_2$.	6.352–6.506.		

XV. Borides, Silicides, &c.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[15] Platinum boride.	Pt B.	17.32.		
[16] Iron silicide.	Fe_2Si.	6.611.		

XVI. Hydrates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[17] Chloric hydrate.	$HClO_3.7H_2O$.	1.282, 14°2. l.		
[18] Perchloric hydrate.	$HClO_4$.	1.782, 15°5. l.		
[19] " "	$HClO_4.H_2O$.	1.811, 50°. l.		50.°
[20] Iodic "	HIO_3.	4.269, 0°.		

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[20] Di[illegible] 13. 303.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Iodic hydrate.	HIO_3.	4.869, 0°.		
[2] " "	"	4.816, 50°8.		
[3] " "	$HIO_3 . 9H_2O$.	2.1269, 13°. s.		
[4] Periodic hydrate.	$HIO_4 . 2H_2O$.			130.°
[5] Sodium "	Na H O.	2.130.		
[6] " "	$Na_2O . 8H_2O$.	1.405.		6.°
[7] Potassium "	K H O.	2.100.		
[8] " "	"	2.044.		
[9] Sulphurous "	$H_2SO_3 . 8H_2O$.			4.°
[10] Sulphuric "	H_2SO_4.	1.849, 10°.		
[11] " "	"	1.842, 15°.		
[12] " "	"	1.854, 0°.		
[13] " "	"	1.842, 12°.	338.°	10°5.
[14] " "	"	1.834, 24°.		
[15] " " Fuming.	$H_2S_2O_7$.	1.9.		s. at 0.°
[16] " "	$H_2SO_4 . H_2O$.	1.784, 8.°	205°–210°	8.°
[17] " "	"			8°5.
[18] " "	$H_2SO_4 . 2H_2O$.	1.62.	193.	
[19] Selenic "	H_2SeO_4.	2.524–2.625.		
[20] " "	"	2.627.+ tr. H_2O.		
[21] Telluric "	$H_2TeO_4 . 2H_2O$.	2.340.		
[22] Calcium "	CaH_2O_2.	2.078.		
[23] Strontium "	SrH_2O_2.	3.625.		
[24] " "	$SrH_2O_2 . 8H_2O$.	1.396.		
[25] Barium "	BaH_2O_2.	4.495.		
[26] " "	$BaH_2O_2 . 8H_2O$	1.656.		
[27] Manganese "	$Mn_2O_3 . H_2O$.	4.335. Manganite.		
[28] Turgite.	$2Fe_2O_3 . H_2O$.	3.56–3.74. Ural.		
[29] "	"	4.29–4.49. Fr. Hof.		
[30] "	"	4.681. Fr. Horhausen.		
[31] "	"	4.14. Fr. Salisbury.		
[32] Göthite.	$Fe_2O_3 . H_2O$.	4.37. Fr. Lostwithiel.		
[33] Limonite.	$2Fe_2O_3 . 3H_2O$.	3.6–4.0.		
[34] Limnite.	$Fe_2O_3 . 3H_2O$.	2.69. Fr. Cornwall.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Uranium hydrate.	$U_2O_3 . H_2O$.	5.926.		
[2] Diaspore.	$Al_2O_3 . H_2O$.	3.4324.		
[3] «	«	3.452.		
[4] «	«	3.45. From Asia Minor.		
[5] «	«	3.29. « Trumbull.		
[6] «	«	3.39. « Chester.		
[7] «	«	3.343. « «		
[8] Gibbsite.	$Al_2O_3 . 3 H_2O$.	2.387. « Ural.		
[9] «	«	2.389. « Richmond.		
[10] Brucite.	$Mg H_2O_2$.	2.35.		
[11] «	«	2.35.		
[12] «	«	2.44. Nemalite.		
[13] «	«	2.4. Fr. Wermland.		
[14] «	«	2.36.		
[15] «	«	2.376. Fr. Orenburg.		
[16] Zinc hydrate.	$Zn H_2O_2$.	3.053.		
[17] « «	«	2.677.		
[18] Nitric «	$H N O_3$.	1.5543. 15°5.		
[19] « «	«	1.522. 12°5.	86.°	
[20] « «	«	1.552, 15.°	86.°	
[21] Nitric subhydrate.	$H_2N_4O_{11}$.	1.642. 18.°		s.+5.°
[22] Boric hydrate.	$B_2O_3 . 3 H_2O$.	1.479.		
[23] « «	«	1.4347. 15.°		
[24] Phosphorous hydrate	H_3PO_3.			74.°
[25] Phosphoric «	$P_2O_5 . 3 H_2O$.	1.88.		
[26] Stibiconite.	$Sb_2O_4 . H_2O$.	5.28.		
[27] Antimonic hydrate.	$Sb_2O_5 . 5 H_2O$.	6.6. Artificial.		
[28] Lead dioxide hydrate.	$PbO_2 . H_2O$.	6.267.		
[29] Manganese « «	$MnO_2 . H_2O$.	2.564–2.596.		
[30] Bismuth « «	$BiO_2 . H_2O$.	5.571.		
[31] Cobaltic hydrate.	$Co_2O_3 . 2 H_2O$.	2.483.		
[32] Nickelic	$Ni_2O_3 . 2 H_2O$.	2.741.		

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XVII. Chlorates and Perchlorates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium chlorate.	$NaClO_3$.	2.467.		
[2] " "	"	2.289.		
[3] Potassium "	$KClO_3$.	2.32643, 4.°		
[4] " "	"	2.350, 17°5.		
[5] " "	"	2.325.		
[6] " "	"			334.°
[7] Silver "	$AgClO_3$.	4.430.		
[8] Barium "	$BaCl_2O_6.H_2O$.	2.988. 15.°		
[9] Potassium perchlorate.	$KClO_4$.	2.528–2.550.		
[10] Thallium "	$TlClO_4$.	4.844. 15°5.		

XVIII. Bromates and Iodates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Sodium bromate.	$NaBrO_3$.	3.339, 17°5.		
[12] Potassium "	$KBrO_3$.	3.271, 17°5.		
[13] Sodium iodate.	$NaIO_3$.	4.277, 17°5.		
[14] Potassium iodate.	KIO_3.	3.979, 17°5.		
[15] " "	"	2.601.		

XIX. Sulphites and Hyposulphites.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Sodium sulphite.	$Na_2SO_3.10H_2O$.	1.561.		
[17] Sodium hyposulphite	$Na_2S_2O_3.5H_2O$.	1.672.		
[18] " "	"	1.736, 10.°		45.°
[19] " "	"			56.°
[20] " "	"	1.734.		
[21] Potassium "	$K_2S_2O_3$.	2.590.		

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XX. SULPHATES.

1st. SIMPLE, ANHYDROUS SULPHATES.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Lithium sulphate.	$Li_2 S O_4$.	2.210.		
[2]	Sodium "	$Na_2 S O_4$.	2.462.		
[3]	" "	"	2.645.		
[4]	" "	"	2.67.		
[5]	" "	"	2.73.		
[6]	" "	"	2.640.		
[7]	" "	"	2.6313.		
[8]	" "	"	2.597.		
[9]	" "	"	2.629.		
[10]	" "	"	2.65606, 4°.		
[11]	" "	"	2.654–2.658. Crystallized at different temperatures.		
[12]	" "	"	2.674–2.684. Crystallized at different temperatures.		
[13]	" "	"	2.693. m. of 3.		
[14]	Potassium "	$K_2 S O_4$.	2.636.		
[15]	" "	"	2.4073.		
[16]	" "	"	2.400.		
[17]	" "	"	2.6232.		
[18]	" "	"	2.880.		
[19]	" "	"	2.662.		
[20]	" "	"	2.640.		
[21]	" "	"	2.625.		
[22]	" "	"	2.644. Cryst.		
[23]	" "	"	2.657. After fusion.		
[24]	" "	"	2.653.		
[25]	" "	"	2.658.		
[26]	" "	"	2.572.		
[27]	" "	"	2.645.		
[28]	" disulphate.	$K_2 S_2 O_7$.	2.277.		210.°
[29]	Ammonium sulphate	$(N H_4)_2 S O_4$.	1.750.		
[30]	" "	"	1.76147, 4°.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Ammonium sulphate	$(NH_4)_2SO_4$.	1.7676.		
[2]	" "	"	1.76—1.78.		
[3]	" "	"	1.628.		
[4]	" "	"	1.771. m. of 2.		
[5]	" "	"	1.750.		
[6]	" "	"			140.°
[7]	Silver "	Ag_2SO_4.	5.341.		
[8]	" "	"	5.322.		
[9]	" "	"	5.410.		
[10]	" "	"	5.425.		
[11]	Thallium "	Tl_2SO_4.	6.77.		
[12]	" "	"	6.603.		
[13]	Calcium "	$CaSO_4$.	2.9271.		
[14]	" "	"	2.960.		
[15]	" "	"	3.102.		
[16]	" "	"	2.969. Artif. cryst.		
[17]	" "	"	2.983. Anhydrite.		
[18]	" "	"	2.92, 15°. Anhydrite.		
[19]	Strontium "	$SrSO_4$.	3.973. Celestine.		
[20]	" "	"	3.9593. "		
[21]	" "	"	3.96. "		
[22]	" "	"	3.86. "		
[23]	" "	"	3.962, 0°. "		
[24]	" "	"	3.927. Artif. cryst.		
[25]	" "	"	3.5883. Precipitated.		
[26]	" "	"	3.770. "		
[27]	" "	"	3.707. "		
[28]	Barium "	$BaSO_4$.	4.42.		
[29]	" "	"	4.446.		
[30]	" "	"	4.2003.		
[31]	" "	"	4.4695, 0°.		
[32]	" "	"	4.4773. } Barite. Extremes of seven determinations.		
[33]	" "	"	4.4872. }		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Barium Sulphate.	$BaSO_4$.	4.4794. } Barite in		
[2]	" "	"	4.4804. } powder.		
[3]	" "	"	4.5271. } Precipitated.		
[4]	" "	"	4.5253. }		
[5]	" "	"	4.179. Artif. cryst.		
[6]	" "	"	4.512. } Precipitates		
[7]	" "	"	4.022. } in different		
[8]	" "	"	4.065. } conditions.		
[9]	Lead "	$PbSO_4$.	6.298.		
[10]	" "	"	6.1691.		
[11]	" "	"	6.30.		
[12]	" "	"	6.35. Fr. Phœnixville.		
[13]	" "	"	6.20. Fr. Coquimbo.		
[14]	Manganese monosulphate.	$MnSO_4$.	3.1, 14.°		
[15]	Iron monosulphate.	$FeSO_4$.	2.841.		
[16]	" "	"	3.138.		
[17]	Cobalt "	$CoSO_4$.	3.531.		
[18]	Copper "	$CuSO_4$.	3.631.		
[19]	" "	"	3.572.		
[20]	" "	"	3.530.		
[21]	Zinc "	$ZnSO_4$.	3.681. m. of 2.		
[22]	" "	"	3.400.		
[23]	" "	"	3.400.		
[24]	Magnesium "	$MgSO_4$.	2.6066.		
[25]	" "	"	2.706. m. of 2.		
[26]	" "	"	2.628.		
[27]	Mercurous sulphate.	Hg_2SO_4.	7.560.		
[28]	Mercuric "	$HgSO_4$.	6.466.		
[29]	Aluminum "	$Al_2(SO_4)_3$.	2.7400.		
[30]	" "	"	2.171.		
[31]	Alumian.	$Al_2O_3.2SO_3$.	2.702–2.781.		

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2d. SIMPLE HYDRATED SULPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lithium sulphate.	$Li_2 S O_4 . H_2 O$.	2.02.		
[2] Sodium "	$Na_2 SO_4 . 10 H_2 O$.	1.469. m. of 2.		
[3] " "	"	1.4457.		
[4] " "	"	1.520.		
[5] " "	"	1.350.		
[6] " "	"	1.465.		
[7] " "	"	1.471.		
[8] " "	"	1.4608. }		
[9] " "	"	1.4595. }		
[10] Mascagnite.	$(NH_4)_2 SO_4 . H_2 O$.	1.72—1.73.		
[11] Calcium sulphate.	$2 Ca S O_4 . H_2 O$.	2.757.		
[12] " "	$Ca S O_4 . 2 H_2 O$.	2.322.		
[13] " "	"	2.310.		
[14] " "	"	2.307. Gypsum.		
[15] " "	"	2.331.		
[16] " "		2.317. m. of 15. Gypsum.		
[17] " "		2.3057.		
[Vitriols.]				
[18] Manganese sulphate.	$Mn S O_4 . 5 H_2 O$.	1.834.		
[19] " "	"	2.095–2.087.		
[20] Iron "	$Fe S O_4 . 7 H_2 O$.	1.857. m. of 3.		
[21] " "	"	1.8889, 4.°		
[22] " "	"	1.8399.		
[23] " "	"	1.904.		
[24] " "	"	1.884.		
[25] " "	"	1.902.		
[26] Nickel "	$Ni S O_4 . 7 H_2 O$.	2.037.		
[27] " "	"	1.931.		
[28] " "	"	2.004. Morenosite.		
[29] Cobalt "	$Co S O_4 . 7 H_2 O$.	1.924.		
[30] Copper "	$Cu S O_4 . 5 H_2 O$.	2.2.		
[31] " "	"	2.1943.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Copper sulphate.	$CuSO_4.5H_2O$.	2.297. Natural.		
[2]	" "	"	2.274.		
[3]	" "	"	2.254.		
[4]	" "	"	2.286.		
[5]	" "	"	2.2901. }		
[6]	" "	"	2.2422. } 4.°		
[7]	" "	"	2.2781. }		
[8]	" "	"	2.302.		
[9]	" "	"	2.2778.		
[10]	Zinc "	$ZnSO^4.7H_2O$.	2.036.		
[11]	" "	"	1.912.		
[12]	" "	"	1.931. m. of 4.		
[13]	" "	"	2.036.		
[14]	" "	"	1.953.		
[15]	" "	"	1.957,		
[16]	" "	"	1.9534.		
[17]	Magnesium "	$MgSO_4.7H_2O$.	1.751.		
[18]	" "	"	1.6603.		
[19]	" "	"	1.674.		
[20]	" "	"	1.660.		
[21]	" "	"	1.6829, 4.°		
[22]	" "	"	1.751.		
[23]	" "	"	1.685.		
[24]	" "	"	1.675.		
[25]	" "	"	1.636, 15°5. Epsomite.		
[26]	" "	$MgSO_4.H_2O$.	2.517. Kieserite.		
[27]	Cadmium "	$CdSO_4.H_2O$.	2.939.		
[28]	" "	$3CdSO_4.8H_2O$.	3.05. 12.°		
[29]	Chromic "	$Cr_2(SO_4)_3.15H_2O$.	1.696. 22.°		
[30]	Coquimbite.	$Fe_2(SO_4)_3\ 9H_2O$.	2.0–2.1.		
[31]	Copiapite.	$2Fe_2O_3.5SO_3.12H_2O$	2.14.		
[32]	Raimondite.	$2Fe_2O_3.3SO_3.7H_2O$	3.190–3.222.		
[33]	Fibroferrite.	$2Fe_2O_3.5SO_3.27H_2O$	1.84.		

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[28] Gi 6.
[29] S L. 53. 513.
[30] ogy.
[31] 's Miner
[32]
[33]

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Aluminum sulphate.	$Al_2(SO_4)_3.18H_2O$.	1.671. m. of 2.		
[2] " "	"	1.569.		
[3] " "	"	1.6–1.8. Alunogen.		
[4] Aluminite.	$Al_2O_3SO_3.9H_2O$.	1.66.		
[5] Felsobanyite.	$2Al_2O_3.SO_3.10H_2O$	2.33.		

3d. ANHYDROUS DOUBLE SULPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[6] Sodium hydrogen sulphate.	$NaHSO_4$.	2.742.		
[7] Potassium " "	$KHSO_4$.	2.163.		
[8] " " "	"	2.112.		
[9] " " "	"	2.475. m. of 2.		
[10] " " "	"	2.47767, 4.°		
[11] Ammonium " "	$NH_4.HSO_4$.	1.761. m. of 2.		
[12] " " "	"	1.787.		
[13] Sodium potassium "	$3K_2SO_4.Na_2SO_4$.	2.668. Pulv.cryst.		
[14] " " "	"	2.671. Aft.fusion.		
[15] Ammonium " "	$NH_4.KSO_4$.	2.280.		
[16] Glauberite.	$CaSO_4.Na_2SO_4$.	2.767.		
[17] "	"	2.64.		
[18] Dreelite.	$CaSO_4.3BaSO_4$.	3.2–3.4.		
[19] Potassium aluminum sulphate.	$AlK(SO_4)_2$.	2.228. m. of 2.		
[20] Ammonium aluminum sulphate.	$NH_4.K(SO_4)_2$.	2.039.		
[21] Manganese potassium sulphate.	$MnK_2(SO_4)_2$.	3.008. m. of 2.		
[22] Nickel potassium "	$NiK_2(SO_4)_2$.	2.897. m. of 2.		
[23] Copper " "	$CuK_2(SO_4)_2$.	2.797. m. of 2.		
[24] " ammonium "	$Cu(NH_4)_2(SO_4)_2$.	2.197. m. of 2.		
[25] Zinc potassium "	$ZnK_2(SO_4)_2$.	2.816.		
[26] " ammonium "	$Zn(NH_4)_2(SO_4)_2$.	2.222.		
[27] Magnesium potassium sulphate.	$MgK(SO_4)_2$.	2.676.		

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[24] Playfair and Joule. 11.
[25] Playfair and Joule. 11.
[26] Playfair and Joule. 11.
[27] Playfair and Joule. 11.

4th. HYDRATED DOUBLE SULPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ammonium sodium sulphate.	$NH_4.NaSO_4.2H_2O$.	1.63.		
[2] Manganese ammonium sulphate.	$(NH_4)_2Mn(SO_4)_2.6H_2O$	1.930.		
[3] Iron potassium sulphate	$K_2Fe(SO_4)_2.6H_2O$.	2.202.		
[4] " " "	"	2.189.		
[5] " ammonium "	$(NH_4)_2Fe(SO_4)_2.6H_2O$	1.848. m. of 2.		
[6] " " "	"	1.813.		
[7] Nickel potassium "	$K_2Ni(SO_4)_2.6H_2O$.	2.111–2.136.		
[8] " ammonium "	$(NH_4)_2Ni(SO_4)_2.6H_2O$	1.783.		
[9] " " "	"	1.915.		
[10] " " "	"	1.921.		
[11] Cobalt potassium "	$K_2Co(SO_4)_2.6H_2O$.	2.154.		
[12] " ammonium "	$(NH_4)_2Co(SO_4)_2.6H_2O$	1.873.		
[13] Copper potassium "	$K_2Cu(SO_4)_2.6H_2O$.	2.244. m. of 2.		
[14] " " "	"	2.16376, 4.°		
[15] " " "	"	2.137.		
[16] " ammonium "	$(NH_4)_2Cu(SO_4)_2.6H_2O$	1.756–1.757.		
[17] " " "	"	1.891. m. of 2.		
[18] " " "	"	1.89378, 4.°		
[19] " " "	"	1.931.		
[20] Zinc potassium "	$K_2Zn(SO_4)_2.6H_2O$.	2.153.		
[21] " " "	"	2.245.		
[22] " " "	"	2.24034, 4.°		
[23] " " "	"	2.153.		
[24] " ammonium "	$(NH_4)_2Zn(SO_4)_2.6H_2O$	1.897. m. of 2.		
[25] " " "		1.910.		
[26] Cadmium potassium sulphate.	$K_2Cd(SO_4)_2.6H_2O$.	2.438.		
[27] Cadmium ammonium sulphate.	$(NH_4)_2Cd(SO_4)_2.6H_2O$	2.073.		

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[26] C[illegible]
[27] [illegible]

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Magnesium potassium sulphate.	$K_2 Mg (S O_4)_2 . 6 H_2 O$.	2.076. m. of 2.		
[2]	" " "	"	2.05319, 4.°		
[3]	" " "	"	1.995.		
[4]	" ammonium "	$(NH_4)_2 Mg (SO_4)_2 . 6 H_2 O$	1.696.		
[5]	" " "	"	1.721.		
[6]	" " "	"	1.71686, 4.°		
[7]	" " "	"	1.680.		
[8]	" " "	"	1.762.		
[9]	Lœwite.	$2MgSO_4 . 2Na_2SO_4 . 5H_2O$	2.376.		
[10]	Fauserite.	$MgSO_4 . 2MnSO_4 . 15H_2O$	1.88.		
[11]	Magnesium iron sulphate.	$Mg Fe (S O_4)_2 . 14 H_2 O$.	1.733.		
[12]	" copper "	$Mg Cu (S O_4)_2 . 14 H_2 O$.	1.813.		
[13]	" zinc "	$Mg Zn (S O_4)_2 . 14 H_2 O$.	1.817.		
[14]	" cadmium "	$Mg Cd (S O_4)_2 . 14 H_2 O$.	1.983.		
	[Alums.]				
[15]	Sodium alum.	$Al Na (S O_4)_2 . 12 H_2 O$.	1.641.		
[16]	" "	"	1.567.		
[17]	Potassium "	$Al K (S O_4)_2 . 12 H_2 O$.	1.753.		
[18]	" "	"	1.7109.		
[19]	" "	"	1.724.		
[20]	" "	"	1.726. m. of 4.		
[21]	" "	"	1.75125, 4.°		
[22]	" "	"	4.722.		
[23]	" "	"	1.757.		
[24]	" "	"	1.7505.		
[25]	Rubidium alum.	$Al Rb (S O_4)_2 . 12 H_2 O$.	1.874.		
[26]	Cæsium "	$Al Cs (S O_4)_2 . 12 H_2 O$.	2.003.		
[27]	Ammonium "	$Al (NH_4)(SO_4)_2 . 12 H_2 O$.	1.602.		
[28]	" "	"	1.625.		
[29]	" "	"	1.626.		
[30]	" "	"	1.625.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ammonium alum.	$Al(NH_4)(SO_4)_2.12H_2O.$	1.621.		
[2] " "	"	1.653.		
[3] Potassium chrome alum	$Cr\,K\,(S\,O_4)_2.\,12\,H_2\,O.$	1.848.		
[4] " " "	"	1.826.		
[5] " " "	"	1.85609, 4.°		
[6] " " "	"	1.845, 12.°		
[7] Ammonium " "	$Cr(NH_4)(SO_4)_2.12H_2O.$	1.738, 21.°		
[8] " iron "	$Fe(NH_4)(SO_4)_2.12H_2O.$	1.712.		
[9] " " "	"	1.718.		
[10] Jarosite.	$K_2SO_4.4Fe_2SO_6.9H_2O.$	3.256.		
[11] Alunite.	$K_2SO_4.3Al_2SO_6.6H_2O.$	2.481.		
[12] Löwigite.	$K_2SO_4.3Al_2SO_6.9H_2O.$	2.58.		

5th. BASIC AND AMMONIO-SULPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Turpeth mineral.	$Hg\,S\,O_4.\,2\,Hg\,O.$	8.319.		
[14] Basic copper sulphate.	$4\,Cu\,O.\,S\,O_3.\,4\,H_2\,O.$	3.082. m. of 2.		
[15] " zinc "	$4\,Zn\,O.\,S\,O_3.\,4\,H_2\,O.$	3.122.		
[16] Linarite.	$Pb\,S\,O_4.\,Cu\,H_2\,O_2.$	5.43.		
[17] Brochantite. }	$2\,Cu\,S\,O_4.\,5\,Cu\,H_2\,O_2.$	3.78–3.87.		
[18] " }	"	3.9069.		
[19] Waringtonite. }	"	3.39–3.47.		
[20] Langite.	$CuSO_4.3CuH_2O_2.H_2O.$	3.48–3.50.		
[21] Silver ammonio sulphate.	$Ag_2\,S\,O_4.\,4\,N\,H_3.$	2.918. m. of 2.		
[22] Copper " "	$Cu\,S\,O_4.\,2\,N\,H_3.$	2.476.		
[23] " " "	$Cu\,S\,O_4.\,2\,N\,H_3.\,3\,H_2\,O.$	1.950.		
[24] " " "	$Cu\,S\,O_4.\,4\,N\,H_3.\,H_2\,O.$	1.790, {Large Cryst.		
[25] " " "	"	1.809, {Small Cryst.		
[26] Zinc " "	$Zn\,S\,O_4.\,2\,N\,H_3.$	2.479.		
[27] Tetramercurammonium sulphate.	$(N_2\,Hg_4)\,S\,O_4.\,2\,H_2\,O.$	7.319.		

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XXI. Selenites and Selenates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Mercury sub-selenite.	$3\,Hg_2\,O.4\,Se\,O_2$.	7.35.		
[2] Barium selenate.	$Ba\,Se\,O_4$.	4.67, 22.°		
[3] Lead "	$Pb\,Se\,O_4$.	6.37, 22.°		
[4] Yttrium "	$Y\,Se\,O_4.3\,H_2\,O$.	2.6770.		
[5] Selenic alum.	$Al\,K(Se\,O_4)_2.12H_2O$.	1.971.		

XXII. Chromates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[6] Potassium chromate.	$K_2\,Cr\,O_4$.	2.612.		
[7] " "	"	2.6402.		
[8] " "	"	2.705.		
[9] " "	"	2.682. m. of 10.		
[10] " "	"	2.711. } 4.°		
[11] " "	"	2.72309. }		
[12] " "	"	2.691.		
[13] " "	"	2.7343.		
[14] " dichromate.	$K_2\,Cr_2\,O_7$.	2.6027.		
[15] " "	"	2.624.		
[16] " "	"	2.692, 4.°		
[17] " "	"	2.721.		
[18] " "	"	2.6616. } 15.°		
[19] " "	"	2.6806. }		
[20] Ammonium "	$(N\,H_4)_2\,Cr_2\,O_7$.	2.367.		
[21] Potassium trichromate	$K_2\,Cr_3\,O_{10}$.	2.655. m. of 3.		
[22] " "	"	3.613.		
[23] Silver chromate.	$Ag_2\,Cr\,O_4$.	5.770.		
[24] Barium "	$Ba\,Cr\,O_4$.	3.90, 11.°		
[25] " "	"	4.49, 23.°		

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[25] Schafarik. 28.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lead chromate.	$Pb\ Cr\ O_4$.	6.00.		
[2] " "	"	5.95.		
[3] " "	"	5.653.		
[4] " "	"	6.118. Artif. cryst.		
[5] Phœnicochroite.	$3\ Pb\ O.\ 2\ Cr\ O_3$.	5.75.		
[6] Basic lead chromate.	$2\ Pb\ O.\ Cr\ O_3$.	6.266.		
[7] Chromic chromate.	$2\ Cr_2\ O_3.\ Cr\ O_3$.	4.0, 10.°		
[8] Copper chromate.	$Cu\ Cr\ O_4.\ 5\ H_2\ O$.	2.262.		
[9] Zinc "	$Zn\ Cr\ O_4.\ 7\ H_2\ O$.	2.096.		
[10] Magnesium chromate.	$Mg\ Cr\ O_4.\ 7\ H_2\ O$.	1.66, 15.°		
[11] " "	"	1.75, 12.°		
[12] Silver ammonio "	$Ag_2\ Cr\ O_4.\ 4\ N\ H_3$.	3.063. m. of 2.		

XXIII. Manganates and Permanganates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Barium manganate.	$Ba\ Mn\ O_4$.	4.85, 23.°		
[14] Potassium permanganate.	$K\ Mn\ O_4$.	2.709.		
[15] " "	"	2.710.		

XXIV. Molybdates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Lead molybdate.	$Pb\ Mo\ O_4$.	5.706. Wulfenite.		
[17] " "	"	6.76. "		
[18] " "	"	6.95. "		
[19] " "	"	8.11. Artif. cryst.		

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[19] Manross. 5. 11.

XXV. TUNGSTATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium tungstate.	$3\,Na_2\,O.\,7\,W\,O_3$.	5.4983.		
[2] " "	$3Na_2O.7WO_3.16H_2O$	3.987, 14.°		
[3] " metatungstate.	$Na_2\,W_4\,O_{13}.\,10\,H_2\,O$.	3.8467, 13.°		
[4] " tungsten tungstate	$Na_2\,O.\,W\,O_2.\,2\,W\,O_3$.	6.617.		
[5] " " "	$Na_2O.2WO_2.2WO_3$.	7.283.		
[6] Potassium tungsten tungstate.	$K_2\,W\,O_4.\,4\,W\,O_2$.	7.6.		
[7] Calcium tungstate.	$Ca\,W\,O_4$.	6.04. Scheelite.		
[8] " "	"	6.03.		
[9] " "	"	6.071.		
[10] " "	"	6.05.		
[11] " "	"	6.03. Scheelite.		
[12] " "	"	6.076. Artif cryst.		
[13] " "	"	6.02. Scheelite.		
[14] Barium metatungstate	$Ba\,W_4\,O_{13}.\,9\,H_2\,O$.	4.298, 14.°		
[15] Lead tungstate.	$Pb\,W\,O_4$.	8.0.		
[16] " "	"	8.1.		
[17] " "	"	8.1032, In mass.		
[18] " "	"	8.1275, Powdered.		
[19] " "	"	8.232. Artif. cryst.		
[20] " "	"	8.238. Artif. cryst.		
[21] " "	"	7.87. Fr. Chili.		
[22] Manganese tungstate.	$Mn\,W\,O_4$.	6.7. Artificial.		
[23] " "	"	7.14. Hübnerite.		
[24] Iron "	$Fe\,W\,O_4$.	7.1. Artificial.		
[25] " "	"	7.169. Ferberite.		
[26] " "	"	6.801. "		
[27] " manganese "	$2MnWO_4.3FeWO_4$.	7.0. Artificial.		
[28] Wolfram.	$Fe\,W\,O_4.\,4\,Mn\,O_4$.	6.67.		
[29] "	$2\,Fe\,W\,O_4.\,3\,Mn\,O_4$.	7.191.		
[30] "	"	7.189–7.535.		
[31] "	Miscellaneous formulæ	7.1–7.55.		

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[31] _____ }

XXVI. Borates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium diborate.	$Na_2 B_4 O_7$.	2.367.		
[2] " "	$Na_2 B_4 O_7$. 5 H_2 O.	1.815.		
[3] " "	$Na_2 B_4 O_7$. 10 H_2 O.	1.757.		
[4] " "	"	1.723.		
[5] " "	"	1.716.		
[6] " "	"	1.74.		
[7] " "	"	1.730. m. of 2.		
[8] " "	"	1.692.		
[9] " "	"	1.692.		
[10] " "	"	1.7156.		
[11] Potassium "	$K_2 B_4 O_7$.	1.740.		
[12] Lead borate.	Pb $B_2 O_4$	5.598. } Fused to		
[13] " hydrogen borate	Pb H $B_3 O_6$.	5.235. } glass.		
[14] Magnesium "	$Mg_3 B_2 O_6$.	2.987. Cryst.		
[15] Didymium "	6 Di O. $B_2 O_3$.	5.825, 14.°		
[16] Magnesium chromium borate.	3 $Cr_2 O_3$. 6 Mg O. 2 $B_2 O_3$.	3.82. Cryst.		
[17] Magnesium iron borate.	3 $Fe_2 O_3$. 6 Mg O. 2 $B_2 O_3$.	3.85. Cryst.		
[18] Szaibelyite.	(5 Mg O. 2 $B_2 O_3$)$_3$. 4 H_2 O.	3.0.		
[19] Hydroboracite.	3CaO.3MgO.8B_2O_3.18H_2O	1.9.		

XXVII. Nitrates.

1st. SIMPLE, ANHYDROUS NITRATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[20] Lithium nitrate.	Li N O_3.	2.334.		
[21] " "	"	2.442.		
[22] Sodium "	Na N O_3.	2.096.		
[23] " "	"	2.188.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Sodium nitrate.	$NaNO_3$.	2.0964.		
[2]	" "	"	2.200.		
[3]	" "	"	2.2256.		
[4]	" "	"	2.182. m. of 4.		
[5]	" "	"	2.2606, 4.°		
[6]	" "	"			310°5.
[7]	" "	"	2.26.		
[8]	" "	"			313°1.
[9]	" "	"	2.256.		
[10]	" "	"	2.265.		
[11]	" "	"	2.236.		
[12]	" "	"	2.18, 15°5. Native.		
[13]	" "	"	2.290. "		
[14]	Potassium nitrate.	KNO_3.	1.933.		
[15]	" "	"	1.9369.		
[16]	" "	"	2.1006.		
[17]	" "	"	2.058.		
[18]	" "	"	2.070. m. of 3.		
[19]	" "	"	2.1078. }		
[20]	" "	"	2.09584. } 4°.		
[21]	" "	"	2.10657. }		
[22]	" "	"	2.109. Large crystals. }		
[23]	" "	"	2.143. Small " }		
[24]	" "	"	2.132. After fusion. }		
[25]	" "	"			339.°
[26]	" "	"			338°3.
[27]	" "	"	2.100.		
[28]	" "	"	2.086.		
[29]	" "	"	2.126.		
[30]	" "	"	2.105.		
[31]	" "	"	2.0845. }		
[32]	" "	"	2.0904. }		
[33]	Ammonium "	NH_4NO_3.		180.°	108.°
[34]	" "	"	1.579.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Ammonium nitrate.	$N H_4 . N O_3$.	1.707.		
[2]	" "	"	1.635. m. of 3.		
[3]	" "	"	1.737. m. of 2.		
[4]	" "	"	1.709.		
[5]	" "	"	1.723.		
[6]	" "	"	1.6915.		
[7]	Silver nitrate.	$Ag N O_3$	4.3554.		
[8]	" "	"	4.336.		
[9]	" "	"			198.°
[10]	" "	"	4.238.		
[11]	" "	"	4.253.		
[12]	" "	"	4.271.		
[13]	" "	"	4.328.		
[14]	Thallium nitrate.	$Tl N O_3$.	5.8.		
[15]	" "	"			205.°
[16]	" "	"	5.55.		
[17]	Calcium "	$Ca N_2 O_6$.	2.240.		
[18]	" "	"	2.472.		
[19]	Strontium "	$Sr N_2 O_6$.	3.0061.		
[20]	" "	"	2.8901.		
[21]	" "	"	2.704.		
[22]	" "	"	2.857.		
[23]	" "	"	2.962. m. of 4.		
[24]	" "	"	2.305.		
[25]	Barium "	$Ba N_2 O_6$.	2.9149.		
[26]	" "	"	3.1848.		
[27]	" "	"	3.284. m. of 5.		
[28]	" "	"	3.16052, 4.°		
[29]	" "	"	3.200.		
[30]	" "	"	3.240–3.242. Cryst. at different temperatures.		
[31]	" "	"	3.228–3.222.		
[32]	" "	"	3.208–3.241.		
[33]	" "	"	3.404.		
[34]	Lead "	$Pb N_2 O_6$.	4.068.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lead nitrate.	$Pb\ N_2\ O_6$.	4.769.		
[2] " "	"	4.3998.		
[3] " "	"	4.340.		
[4] " "	"	4.316. m. of 3.		
[5] " "	"	4.472, 4.°		
[6] " "	"	4.581.		
[7] " "	"	4.429.		
[8] " "	"	4.423.		
[9] " "	"	4.509.		
[10] " "	"	4.235.		

2d. HYDRATED NITRATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Calcium nitrate.	$Ca\ N_2\ O_6$. $4\ H_2\ O$.	1.78.		
[12] " "	"	1.90, 15°5. s.	132.°	44.°
[13] " "	"	1.79, 15°5. l.		
[14] Strontium "	$Sr\ N_2\ O_6$. $5\ H_2\ O$.	2.113.		
[15] Manganese "	$Mn\ N_2\ O_6$. $6\ H_2\ O$.	1.8199, 21.° s.	129°5.	25°8.
[16] " "	"	1.8104, 21.° l.		
[17] Nickel "	$Ni\ N_2\ O_6$. $6\ H_2\ O$.		136°7.	56°7.
[18] Cobalt "	$Co\ N_2\ O_6$. $6\ H_2\ O$.	1.83, 14.°		
[19] Copper "	$Cu\ N_2\ O_6$. $3\ H_2\ O$.	2.174.		
[20] " "	"	2.047. m. of 3.		
[21] " "	"		170.°	114°5.
[22] Zinc "	$Zn\ N_2\ O_6$. $6\ H_2\ O$.		131.°	36°4.
[23] Magnesium "	$Mg\ N_2\ O_6$. $6\ H_2\ O$.	1.464.		
[24] " "	"		143.°	90.°
[25] Cadmium "	$Cd\ N_2\ O_6$. $4\ H_2\ O$.		132.°	59°5.
[26] Mercurous "	$Hg\ N\ O_3$. $H_2\ O$.	4.785. m. of 3.		
[27] Mercuric "	$Hg\ N_2\ O_6$. $8\ H_2\ O$.			6°6.
[28] Glucinum "	$Gl\ N_2\ O_6$. $3\ H_2\ O$.		140°5.	60.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lanthanum nitrate.	$La N_2 O_6 . 3 H_2 O$.		120.°	40.°
[2] Chromium "	$Cr_2 O_3 . 3 N_2 O_5 . 18 H_2 O$.		125°5.	37.°
[3] Iron "	$Fe_2 O_3 . 3 N_2 O_5 . 18 H_2 O$.	1.6835, 21.° s.	125.°	47°2.
[4] " "	"	1.6712. l.		
[5] Aluminum "	$Al_2 O_3 . 3 N_2 O_5 . 18 H_2 O$.		134.°	72°8.
[6] Uranium "	$U_2 O_3 . N_2 O_5 . 6 H_2 O$.	2.807, 13.°		
[7] " "	"		118.°	59°5.
[8] " "	"			120.°
[9] Bismuth "	$Bi N_3 O_9 . 5 H_2 O$.	2.736. m. of 2.		

3d. BASIC AND AMMONIC NITRATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[10] Basic copper nitrate.	$3 Cu O . N_2 O_5 . H_2 O$.	2.765. m. of 3.		
[11] " mercury "	$2 Hg O . N_2 O_5 . 2 H_2 O$.	4.242.		
[12] " " "	$Hg_2 O . 4 Hg N O_3 . 3 H_2 O$.	5.967.		
[13] " lead "	$2 Pb O . N_2 O_5$.	5.645.		
[14] " bismuth "	$Bi_2 O_3 . N_2 O_5 . H_2 O$.	4.551.		
[15] " " "	$Bi_2 O_3 . N_2 O_5 . 2 H_2 O$.	5.260. m. of 2.		
[16] Copper ammonio-nitrate	$Cu N_2 O_6 . 4 N H_3$.	1.874. m. of 3.		
[17] Mercury " "	$2 Hg O . Hg N_2 O_6 . 2 N H_3$	5.970.		

XXVIII. PHOSPHATES.

1st. ANHYDROUS ORTHOPHOSPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18] Potassium dihydrogen phosphate.	$K H_2 P O_4$.	2.298.		
[19] " " "	"	2.403.		
[20] Ammonium dihydrogen phosphate.	$(N H_4) H_2 P O_4$.	1.758.		
[21] Diammonium hydrogen phosphate.	$(N H_4)_2 H P O_4$.	1.619,		

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[18] Schiff
[19] Buig[illegible]
[20] Schi[illegible]
[21] Schi[illegible]

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Diammonium hydrogen phosphate.	$(NH_4)_2 H P O_4$.	1.678.		
[2] Trisilver phosphate.	$Ag_3 P O_4$.	7.300.		
[3] Trithallium phosphate.	$Tl_3 P O_4$.	6.89, 10.°		
[4] Thallium dihydrogen «	$Tl H_2 P O_4$.			190.°
[5] « « «	«	4.723.		
[6] Lead phosphate.	$Pb_3 P_2 O_8$.	7.208.		
[7] Xenotime.	3 Y O. $P_2 O_5$.	4.557.		
[8] «	«	4.54.		
[9] «	«	4.45.		
[10] «	«	4.51.		
[11] «	«	4.39. Castelnaudite.		
[12] Cryptolite.	3 Ce O. $P_2 O_5$.	4.6.		
[13] «	«	4.78. Phosphocerite.		

2d. HYDRATED ORTHOPHOSPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Trisodium phosphate.	$Na_3 P O_4$. 12 H_2 O.	1.622.		
[15] « «	«	1.618.		
[16] « «	«			77.°
[17] Disodium hydrogen phosphate.	$Na_2 H P O_4$. 12 H_2 O.	1.514.		
[18] « «	«	1.525. m. of 3.		
[19] « «	«			36°4.
[20] « «	«	1.586, 8.°		35.°
[21] « «	«	1.525,		
[22] « «	«	1.550.		
[23] « «	«	1.5235, 15.°		
[24] Dihydrogen sodium phosphate.	$Na H_2 P O_4$. H_2 O.	2.040.		
[25] « «				204.°
[26] Triple phosphate. No.1	NH_4.Na H P O_4.4 H_2 O	1.554.		
[27] « «	«	1.6151. Stercorite.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Triple phosphate. No. 2.	$K\,Na\,H\,P\,O_4 . 7\,H_2\,O$.	1.671.		
[2] Dithallium hydrogen phosphate.	$2\,(Tl_2\,H\,P\,O_4) . H_2\,O$.	.		145.°
[3] Brushite.	$Ca\,H\,P\,O_4 . 2\,H_2\,O$.	2.208.		
[4] "	"	2.953–2.999.		
[5] Metabrushite.	$2\,(Ca\,H\,P\,O_4) . 3\,H_2\,O$.	2.288–2.362.		
[6] " Zeugite.	"	2.971–3.030.		
[7] Struvite.	$N\,H_4\,Mg\,P\,O_4 . 6\,H_2\,O$.	1.65.		
[8] Vivianite.	$3\,Fe\,O . P_2\,O_5 . 3\,H_2\,O$.	2.72. Fr. Kertsch.		
[9] "	"	2.58–2.68.		
[10] Dufrenite.	$2\,Fe_2\,O_3 . P_2\,O_5 . 3\,H_2\,O$.	3.227.		
[11] "	"	3.293.		
[12] "	"	3.874.		
[13] "	"	3.024.		
[14] Cacoxenite.	$2\,Fe_2\,O_3 . P_2\,O_5 . 12\,H_2\,O$.	3.38.		
[15] Libethenite.	$Cu_3\,P_2\,O_8 . Cu\,H_2\,O_2$.	3.6—3.8.		
[16] Tagilite.	$Cu_3P_2O_8 . Cu\,H_2O_2 . 2\,H_2O$.	4.076.		
[17] "	"	3.5, a.		
[18] Ehlite.	$Cu_3P_2O_8 . 2\,Cu\,H_2O_2 . H_2O$.	4.131—4.24.		
[19] "	"	4.07—4.198.		
[20] Berlinite.	$4\,(Al\,P\,O_4) . H_2\,O$.	2.64.		
[21] Callainite.	$2\,(Al\,P\,O_4) . 5\,H_2\,O$.	2.5—2.52.		
[22] Augelite.	$2\,Al_2\,O_3 . P_2\,O_5 . 3\,H_2\,O$.	2.77.		
[23] Turquoise.	$2\,Al_2\,O_3 . P_2\,O_5 . 5\,H_2\,O$.	2.426. Chalchihuite.		
[24] "	"	2.651.		
[25] "	"	2.621.		
[26] Peganite.	$2\,Al_2\,O_3 . P_2\,O_5 . 6\,H_2\,O$.	2.492–2.501.		
[27] Fischerite.	$2\,Al_2\,O_3 . P_2\,O_5 . 8\,H_2\,O$.	2.46.		
[28] Sphaerite.	$5\,Al_2\,O_3 . 2\,P_2\,O_5 . 16\,H_2\,O$.	2.536.		
[29] Evansite.	$2Al_2O_3 . P_2O_5 . Al_2H_6O_6 . 15H_2O$	1.939.		
[30] Trolleite.	$3\,Al\,P\,O_4 . Al\,H_3\,O_3$.	3.10.		
[31] Wavellite.	$3\,Al_2\,O_3 . 2\,P_2\,O_5 . 12\,H_2\,O$.	2.337.		
[32] "	"	2.316.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cirrolite.	$2Al_2O_3.6CaO.3P_2O_5.3H_2O.$	3.08.		
[2] Lazulite.	$2\ Al\ P\ O_4.\ Mg\ H_2\ O_2.$	3.057.		
[3] "	"	3.067–3.121.		
[4] "	"	3.122.		
[5] "	"	3.108.		
[6] Torbernite.	$2U_2O_3.P_2O_5.Cu\,H_2O_2.7H_2O.$	3.329–3.372.		
[7] "		3.4—3.6.		
[8] Autunite.	$2U_2O_3.P_2O_5.Ca\,H_2O_2.7H_2O.$	3.05—3.19.		

3d. PYROPHOSPHATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[9] Sodium pyrophosphate	$Na_4\ P_2\ O_7.\ 10\ H_2\ O.$	1.836.		
[10] Silver "	$Ag_4\ P_2\ O_7.$	5.306.		
[11] Thallium "	$Tl_4\ P_2\ O_7.$	6.786.		

XXIX. VANADATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[12] Dechenite.		5.81.		
[13] "		5.83.		
[14] Descloizite.		5.839.		

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XXX. Arsenites and Arsenates.

1st. ANHYDROUS ARSENITES AND ARSENATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lead arsenite.	$Pb\ As_2\ O_4$.	5.85, 23.°		
[2] Potassium dihydrogen arsenate.	$K\ H_2\ As\ O_4$.	2.638.		
[3] " "	"	2.832.		
[4] Ammonium " "	$N\ H_4$. $H_2\ As\ O_4$.	2.249.		
[5] Hydrogen diammonium arsenate.	$(N\ H_4)_2\ H\ As\ O_4$.	1.989.		
[6] Native nickel arsenate.	$5\ Ni\ O$. $As_2\ O_5$.	4.838.		
[7] " " "	$3\ Ni\ O$. $As_2\ O_5$.	4.982.		

2d. HYDRATED ARSENATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Sodium dihydrogen arsenate.	$Na\ H_2\ As\ O_4$. $H_2\ O$.	2.535.		
[9] Disodium hydrogen arsenate.	$Na_2\ H\ As\ O_4$. $7\ H_2\ O$.	1.871.		
[10] " " "	$Na_2\ H\ As\ O_4$. $12\ H_2\ O$.	1.759.		
[11] " " "	"	1.736.		
[12] " " "	"	1.670.		
[13] Trisodium arsenate.	$Na_3\ As\ O_4$. $12\ H_2\ O$.	1.804. m. of 2.		
[14] " "	"	1.762.		
[15] Triple arsenate No. 1.	$N\ H_4$.$Na\ H\ As\ O_4$.$4\ H_2\ O$	1.838.		
[16] " " No. 2.	$K\ Na\ H\ As\ O_4$. $7\ H_2\ O$.	1.884.		
[17] Hoernesite.	$Mg_3\ As_2\ O_8$. $8\ H_2\ O$.	2.474.		
[18] Erythrite.	$Co_3\ As_2\ O_8$. $8\ H_2\ O$.	2.948.		
[19] Scorodite.	$Fe_2\ O_3$. $As_2\ O_5$. $4\ H_2\ O$.	3.11–3.18.		
[20] Adamite.	$Zn_3\ As_2\ O_8$. $Zn\ H_2\ O_2$.	4.338, 18.°		

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XXXI. Antimonites and Antimonates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Romeite.	3 Ca O. $Sb_2 O_3$. $Sb_2 O_5$.	4.714.		
[2] "	"	4.675.		
[3] Monimolite.	4 Pb O. $Sb_2 O_5$. Impure.	5.94.		
[4] Bindheimite.	3 Pb O. $Sb_2 O_5$. 4 H_2 O.	4.6—4.76.		
[5] "	"	4.707. Brown.		
[6] "	"	5.05. White.		

XXXII. Carbonates.

1st. ANHYDROUS SIMPLE CARBONATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[7] Lithium carbonate.	Li_2 C O_3.	2.111.		
[8] Sodium "	Na_2 C O_3.	2.4659.		
[9] " "	"	2.430.		
[10] " "	"	2.509.		
[11] Potassium "	K_2 C O_3	2.2643.		
[12] " "	"	2.103.		
[13] " "	"	2.267.		
[14] Silver "	Ag_2 C O_3.	6.0766.		
[15] " "	"	6.0, 17°5.		
[16] Thallium "	Tl_2 C O_3.	7.06.		
[17] " "	"	7.164.		
[18] Calcium "	Ca C O_3.	2.7000.		
[19] " "	"	2.6946. Chalk.		
[20] Arragonite.	"	2.931.		
[21] "	"	2.927.		
[22] "	"	2.945–2.947.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Arragonite.	Ca C O_3.	2.931.		
[2] «	«	2.938–2.995.		
[3] «	«	2.933, 0.°		
[4] «	«	2.93.		
[5] «	«	2.92.		
[6] «	«	2.72–2.95.		
[7] «	«	2.93.		
[8] «	«	2.884. Mossottite.		
[9] «	«	2.932.		
[10] Calcite.	«	2.7064.		
[11] «	«	2.6987.		
[12] «	«	2.7213.		
[13] «	«	2.7234.		
[14] «	«	2.815. Fr. Stirling, N. J.		
[15] «	«	2.702. Cryst.		
[16] «	«	2.943. m. of 6.		
[17] «	«	2.72.		
[18] Strontium carbonate.	Sr C O_3.	3.605.		
[19] « «	«	3.6245.		
[20] « «	«	3.613.		
[21] « «	«	3.548. Precipitated.		
[22] « «	«	3.620. Precipitated.		
[23] Barium «	Ba C O_3.	4.24.		
[24] « «	«	4.301.		
[25] « «	«	4.35.		
[26] « «	«	4.3019.		
[27] « «	«	4.565.		
[28] « «	«	4.216. Precipitated.		
[29] « «	«	4.235. Precipitated.		
[30] « «	«	4.373. Precipitated.		
[31] Lead «	Pb C O_3.	6.465.		
[32] « «	«	6.5.		
[33] « «	«	6.47.		
[34] « «	«	6.4277.		

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[27] Filhol. 12.
[28] Schröder. 23.
[29] Schröder. 23.
[30] Schröder. 23.
[31] Mohs. See 23.
[32] John. See 23.
[33] Breithaupt.
[34] Karsten.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Lead carbonate.	Pb C O_3.	6.60. Fr. Phœnixville.		
[2] Manganese carbonate.	Mn C O_3.	3.59.		
[3] " "	"	3.553.		
[4] " "	"	3.6608.		
[5] " "	"	3.57.		
[6] " "	"	3.129. } Precipitated.		
[7] " "	"	3.122. }		
[8] Iron "	Fe C O_3.	3.829.		
[9] " "	"	3.872.		
[10] " "	"	3.815. Impure.		
[11] " "	"	3.796, 0.°		
[12] " "	"	3.698.		
[13] Zinc "	Zn C O_3.	4.339.		
[14] " "	"	4.442.		
[15] " "	"	4.3765.		
[16] " "	"	4.45.		
[17] " "	"	4.45.		
[18] " "	"	4.42.		
[19] Cadmium "	Cd C O_3.	4.42, 17.°		
[20] " "	"	4.4938.		
[21] Magnesium "	Mg C O_3.	3.033.		
[22] " "	"	2.81.		
[23] " "	"	2.925.		
[24] " "	"	3.056.		
[25] " "	"	3.065.		
[26] " "	"	3.017.		
[27] " "	"	3.017.		
[28] " "	"	3.007–3.076.		
[29] " "	"	3.033.		
[30] " "	"	3.015.		

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2d. HYDRATED SIMPLE CARBONATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium carbonate.	$Na_2 C O_3 . H_2 O$.	1.5–1.6. Thermonatrite		
[2] " "	$Na_2 C O_3 . 8 H_2 O$.	1.51.		
[3] " "	$Na_2 C O_3 . 10 H_2 O$.	1.423.		
[4] " "	"	1.454, m. of 4.		
[5] " "	"	1.475.		
[6] " "	"	1.463.		
[7] " "	"	1.4402.		
[8] Trona.	$2Na_2O.3CO_2.4H_2O$	2.11.		
[9] Calcium carbonate.	$Ca C O_3 . 5 H_2 O$.	1.783.		
[10] " "	"	1.75.		
[11] Lanthanite.	$La C O_3 . 3 H_2 O$.	2.605, 20.°		
[12] "	"	2.666.		

3d. ANHYDROUS DOUBLE CARBONATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Hydrogen sodium carbonate.	$H Na C O_3$.	2.192. m. of 2.		
[14] " " "	"	2.163.		
[15] " " "	"	2.2208, 15.°		
[16] " potassium "	$H K C O_3$.	2.012.		
[17] " " "	"	2.092.		
[18] " " "	"	2.180.		
[19] " ammonium "	$H N H_4 . C O_3$.	1.586.		
[20] Sodium potassium "	$K Na C O_3$.	2.5289. }		
[21] " " "	"	2.5633. }		
[22] Uranium ammonium carbonate.	$U_2CO_5.2((NH_4)_2CO_3)$	2.7725, 9.°		

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[20] [illegible] 66.
[21] [illegible] 48.
[22] Hunt.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Bromlite.	$Ca\,C\,O_3 . Ba\,C\,O_3$.	3.718.		
[2] "	"	3.76, 15°5.		
[3] " Barytocalcite.	"	3.66.		
[4] Manganocalcite.	$Ca\,C\,O_3 . 2\,Mn\,C\,O_3$.	3.037.		
[5] Dolomite.	$Ca\,C\,O_3 . Mg\,C\,O_3$.	2.72.		
[6] "	"	2.845.		
[7] " Impure.	"	2.629.		
[8] " "	"	2.856.		
[9] " "	"	2.89.		
[10] " "	"	2.924.		
[11] " "	"	2.85.		
[12] Mesitite.	$2\,Mg\,C\,O_3 . Fe\,C\,O_3$.	3.349—3.363.		
[13] Pistomesite.	$Mg\,C\,O_3 . Fe\,C\,O_3$.	3.412—3.417.		
[14] "	"	3.427.		
[15] "	"	3.41.		

4th. BASIC CARBONATES, AND HYDRATED DOUBLE CARBONATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Sodium potassium carbonate.	$K\,Na\,C\,O_3 . 12\,H_2\,O$.	1.6088. } 14.		
[17] " " "	"	1.6334. }		
[18] Gay-Lussite.	$Na_2\,C\,O_3 . Ca\,CO_3 . 5\,H_2O$.	1.928–1.950.		
[19] Hydrodolomite.	$Ca\,C\,O_3 . 2\,Mg\,C\,O_3 . H_2\,O$.	2.495.		
[20] " Pennite.	"	2.86.		
[21] Pencatite.	$Ca\,C\,O_3 . Mg\,H_2\,O_2$.	2.613.		
[22] "	"	2.57.		
[23] Predazzite.	$2\,Ca\,C\,O_3 . Mg\,H_2\,O_2$.	2.634.		
[24] Hydromagnesite.	$3MgCO_3 . MgH_2O_2 . 3H_2O$	2.145–2.180.		
[25] Zaratite.	$NiCO_3 . 2NiH_2O_2 . 4H_2O$.	2.57—2.693.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Malachite.	$Cu\ C\ O_3 . Cu\ H_2\ O_2$.	3.715.		
[2] "	"	3.898.		
[3] "	"	4.06. } Fr. Phœnixville.		
[4] Azurite.	$2\ Cu\ C\ O_3 . Cu\ H_2\ O_2$.	3.88. }		
[5] Hydrozincite.	$Zn\ C\ O_3 . 2\ Zn\ H_2\ O_2$.	3.252.		

XXXIII. SILICATES.

1st. ANHYDROUS SILICATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[6] Wollastonite.	$Ca\ Si\ O_3$.	2.785–2.895.		
[7] "	"	2.805.		
[8] Rhodonite.	$Mn\ Si\ O_3$.	3.63.		
[9] "	"	3.63.		
[10] Grünerite.	$Fe\ Si\ O_3$.	3.713.		
[11] Enstatite.	$Mg\ Si\ O_3$.	3.1—3.13.		
[12] " Kupfferite.	"	3.08.		
[13] "	"	3.11. Artif. cryst.		
[14] Tephroite.	$Mn_2\ Si\ O_4$.	4.1.		
[15] "		4.0.		
[16] Fayalite.	$Fe_2\ Si\ O_4$.	4.138. From Fayal.		
[17] "	"	4.006. " Ireland.		
[18] Willemite.	$Zn_2\ Si\ O_4$.	3.89–4.0.		
[19] "	"	4.154.		
[20] "	"	3.935.		
[21] "	"	4.16–4.18.		
[22] "	"	4.18. Fr. Stolberg. }		
[23] "	"	4.02–4.16. }		
[24] "	"	4.02.		
[25] "	"	4.11–4.16.		
[26] Forsterite.	$Mg_2\ Si\ O_4$.	3.243.		

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[23] { Monh[illegible] 1[illegible]
[24] Herr[illegible]
[25] Mixt[illegible]
[26] Ram[illegible]

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Forsterite. Boltonite.	$Mg_2 Si O_4$.	3.21.		
[2] " "	"	3.008.		
[3] " "	"	2.208–3.328.		
[4] Phenacite.	$Gl_2 Si O_4$.	2.966–2.996.		
[5] Andalusite.	$Al_2 O_3 . Si O_2$.	3.154.		
[6] "	"	3.103.		
[7] "	"	3.070. Fr. Ireland.		
[8] " Fibrolite.	"	3.24.		
[9] " "	"	3.18–3.21.		
[10] " Bucholzite.	"	3.239.		
[11] " Monrolite.	"	3.04–3.1.		
[12] " "	"	3.075.		
[13] " Sillimanite.	"	3.238.		
[14] " "	"	3.232.		
[15] " "	"	3.239.		
[16] " Cyanite.	"	3.48.		
[17] " "	"	3.6.		
[18] " "	"	3.661.		
[19] " "	"	3.678.		
[20] Zircon.	$Zr O_2 . Si O_2$.	4.072–4.681.		
[21] "	"	4.721.		
[22] "	"	4.615–4.710.		
[23] "	"	4.7. From Litchfield.		
[24] "	"	4.047.		
[25] "	"	4.2. From Brevig.		
[26] "	"	4.595. " Reading, Pa.		
[27] "	"	4.602–4.625, Canadian.		
[28] "	"	4.56–4.61.		
[29] "	"	4.395, before heating. } Extremes of six, from different localities.		
[30] "	"	4.515, before heating. } Extremes of six, from different localities.		
[31] "	"	4.438, after heating. } Extremes of six, from different localities.		
[32] "	"	4.863, after heating. } Extremes of six, from different localities.		

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[30] Church. 17. 834.
[31] Church. 17. 834.
[32] Church. 17. 834.

2d. HYDRATED SILICATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Okenite.	Ca O. 2 Si O_2. 2 H_2 O.	2.28.		
[2] "	"	2.362. Dysclasite.		
[3] "	"	2.324.		
[4] Dioptase.	Cu Si O_3. H_2 O.	3.314–3.348.		
[5] Chrysocolla.	Cu Si O_3. 2 H_2 O.	2.0–2.238.		
[6] Picrosmine.	2 Mg Si O_3. H_2 O.	2.66. Massive.		
[7] "	"	2.596. Columnar.		
[8] Talc.	6 Mg O. 5 SiO_2. 2 H_2O.	2.565–2.8.		
[9] Serpentine.	3 Mg O. 2 SiO_2. 2 H_2O.	2.557. Picrolite.		
[10] "	"	2.644.		
[11] "	"	2.219. Chrysotile.		
[12] "	"	2.6–2.65. "		
[13] "	"	2.57.		
[14] Deweylite.	2 Mg O. 3 SiO_2 5 H_2O.	2.246.		
[15] "	"	2.19–2.31.		
[16] "	"	2.216.		
[17] "	"	1.936–2.155.		
[18] Calamine.	2 Zn O. Si O_2. H_2 O.	3.16–3.9.		
[19] Thorite.	3 Th Si O_3. 4 H_2 O.	4.630.		
[20] "	"	4.686.		
[21] "	"	4.344–4.397.		
[22] " Orangite.	"	5.34–5.397.		
[23] " "	"	5.19.		
[24] " "	"	5.397.		
[25] " "	"	4.888–5.205. { Extremes of seven.		

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[25] Chydenius. 16. 818.

XXXIV. Stannates and Titanates.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Calcium titanate.	$Ca\ Ti\ O_3$.	4.10. Artif. cryst.		
[2] " "	"	4.00. " "		
[3] " "	"	4.03–4.039. Perofskite.		
[4] Magnesium titanate.	$Mg\ Ti\ O_3$.	3.91. Artif. cryst.		
[5] Di magnesium "	$Mg_2\ Ti\ O_4$.	3.52. " "		
[6] Di-iron "	$Fe_2\ Ti\ O_4$.	4.37. " "		
[7] Potassium stannate.	$K_2Sn\,O_3.3\,H_2O$.	3.197.		

XXXV. Silicofluorides.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Lithium silicofluoride.	$2\ Li\ F.\ Si\ F_4.\ 2\ H_2\ O$.	2.33.		
[9] Sodium "	$2\ Na\ F.\ Si\ F_4$.	2.7547, 17°5.		
[10] Potassium "	$2\ K\ F.\ Si\ F_4$.	2.6655. } 17°5.		
[11] " "	"	2.6649. }		
[12] Rubidium "	$2\ Rb\ F.\ Si\ F_4$.	3.3383, 20.°		
[13] Cæsium "	$2\ Cs\ F.\ Si\ F_4$.	3.3756, 17.°		
[14] Barium "	$Ba\ F_2.\ Si\ F_4$.	4.2794, 21.°		
[15] Copper "	$2(CuF_2.SiF_4.).13H_2O$	2.1576, 19.°		

XXXVI. Cyanides and Cyanates.

1st. SIMPLE CYANIDES AND CYANATES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[16] Potassium cyanide.	$K\ Cy$.	1.52, 12.°		
[17] Ammonium "	$N\ H_4\ Cy$.		36.°	
[18] Silver "	$Ag\ Cy$.	3.943, 11.°		
[19] Mercury "	$Hg\ Cy_2$.	3.77, 13.°		
[20] Phosphorus "	$P\ Cy_3$.			200°–203.°
[21] Potassium cyanate.	$K\ Cy\ O$.	2.0475, 16.°		
[22] Silver "	$Ag\ Cy\ O$.	4.004, 16.°		

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2d. COMPOUND CYANIDES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sodium ferrocyanide.	$Na_4 Cy_6 Fe. 12 H_2 O.$	1.458.		
[2] Potassium "	$K_4 Cy_6 Fe. 3 H_2 O.$	1.83.		
[3] " "	"	1.86.		
[4] " "	"	2.052.		
[5] Thallium "	$Tl_4 Cy_6 Fe. 2 H_2 O.$	4.641.		
[6] Potassium ferricyanide	$K_3 Cy_6 Fe.$	1.8004.		
[7] " "	"	1.845.		
[8] " "	"	1.849.		
[9] " "	"	1.817.		
[10] " cobalticyanide.	$K_3 Cy_6 Co.$	1.906, 11.°		
[11] Barium platinocyanide	$Ba Cy_4 Pt.$	3.054.		
[12] Potassium sulphocyanide.	K Cy S.	1.866. } 14.°		
[13] " "	"	1.906. }		
[14] " "	"			161°2.
[15] Lead "	$Pb Cy_2 S_2.$	3.82.		
[16] Titanium nitrocyanide	$Ti Cy_2. 3 Ti_3 N_2.$	5.30.		
[17] " "	"	5.28001.		

XXXVII. MISCELLANEOUS INORGANIC COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18] Cyanogen. l.	N C.	.866, 17°2.		—34°5.
[19] Ammonia. l.	$N H_3.$	.731, 15°5.		—75.°
[20] " l.	"	.6234, o.° m. of 3.		
[21] " l.	"	.6492,—10.°		
[22] " l.	"	.6429,—5.°		
[23] " l.	"	.6364, o.°		
[24] " l.	"	.6298, 5.°		
[25] " l.	"	.6230, 10.°		
[26] " l.	"	.6160, 15.°		
[27] " l.	"	.6089, 20.°		

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[25] [illegible]ndreéff. 22.
[26] [illegible]reéff. 22.
[27] [illegible]reéff. 22.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Nitrogen chlorophosphide.	$P_3 N_3 Cl_6$.		(a. 240.)	110.
[2] " "	"	1.98.		
[3] Cryst. Titanium compound.	$3 Ti O_2 . P_2 O_5$.	2.9.		
[4] Potassium chlorochromate.	$K Cl . Cr O_3$.	2.466.		
[5] " "	"	2.49702, 4.°		
[6] Sodium fluo-phosphate	$Na_3 P O_4 . Na F . 12 H_2 O$.	2.2165, 25.°		
[7] " fluo-arsenate.	$Na_3 As O_4 . Na F . 12 H_2 O$.	2.849, 25.°		
[8] Potassium fluoborate.	$K B F_4$.	2.5–2.6.		
[9] Potassium nitro-sulphate.	$K_2 S O_4 . H N O_3$.	2.38.		150.°
[10] Potassium phosphato-sulphate.	$K_2 S O_4 . H_3 P O_4$.	2.296.		240.°
[11] Sphene.	$Ca O . Si O_2 . Ti O_2$.	3.45. Artif. cryst.		
[12] "	"	3.49–3.51.		
[13] " Guarinite.	"	3.487.		
[14] Leadhillite.	$Pb S O_4 . 3 Pb C O_3$.	6.550.		
[15] "	"	6.526.		
[16] " Susannite.	"	6.5–6.55.		
[17] Lanarkite.	$Pb S O_4 . Pb C O_3$.	6.3–6.4.		
[18] Phosgenite.	$Pb C O_3 . Pb Cl_2$.	6.0–6.31.		
[19] Wagnerite.	$Mg_3 P_2 O_8 . Mg F_2$.	3.068–2.985.		
[20] Apatite.	$3 Ca_3 P_2 O_8 . Ca Cl_2$.	3.054. Artif. cryst.		
[21] "	"	3.565.		
[22] "	"	3.234.		
[23] "	"	3.20.		
[24] "	"	3.091. } Extremes of seven determinations.		
[25] "	"	3.216. }		
[26] Pyromorphite.	$3 Pb_3 P_2 O_8 . Pb Cl_2$.	7.008. Artif. cryst.		
[27] "	"	7.1.		
[28] "	"	6.94.		
[29] "	"	7.36.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Mimetite.	$3\ Pb_3\ As_2\ O_8.\ Pb\ Cl_2.$	7.218.		
[2] "	"	7.32.		
[3] Boracite.	$6\,Mg\ O.8\ B_2O_3.Mg\,Cl_2$	2.974.		
[4] "	"	2.9134.		
[5] Vanadinite.	$3\ Pb_3\ V_2\ O_8.\ Pb\ Cl_2.$	6.886. Carinthian.		
[6] "	"	6.863. Siberian.		
[7] "	"	6.707 .12.° Artif.		

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XXXVIII. Alloys.

For the following table completeness is not claimed. The compiler has merely sought to tabulate the more important published determinations of the Specific Gravities and Melting Points of Alloys, including only those alloys whose composition admits of moderately simple formulas. Some of these substances are, doubtless, definite chemical compounds; but the formulas, in most cases, merely indicate the proportions of the metals in the alloys.

1st. ALLOYS CONTAINING BUT TWO METALS.

Alloy.	Specific Gravity.	Melting Point.
Silver and Lead.		
[1] Ag_4 Pb.	10.800, 13°5.	
[2] Ag_2 Pb.	10.925, 13°8.	
[3] Ag Pb.	11.054, 12°5.	
[4] Ag Pb_2.	11.144, 18°2	
[5] Ag Pb_4.	11.196, 21.°	
[6] Ag Pb_{10}.	11.285, 22°2.	
[7] Ag Pb_{25}.	11.334, 20°6.	
Copper and Lead.		
[8] Cu Pb.	10.375.	
[9] Cu_2 Pb_3.	10.753.	
Iridium and Osmium.		
[10] Ir Os. Newjanskite.	19.386—19.471.	
[11] Ir Os_4. · Sisserskite.	21.118.	
Silver and Copper.		
[12] Ag_3 Cu_2.	9.9045.	
Copper and Zinc.		
[13] Cu_{10} Zn.	8.605.	
[14] Cu_9 Zn.	8.607.	
[15] Cu_8 Zn.	8.633.	
[16] Cu_7 Zn.	8.587.	
[17] Cu^6 Zn.	8.591.	
[18] Cu_5 Zn.	8.415.	
[19] «	8.673.	

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Alloy.	Specific Gravity.	Melting Point.
[1] Cu_4 Zn.	8.448.	
[2] "	8.650.	
[3] Cu_3 Zn.	8.397.	
[4] "	8.576.	
[5] Cu_2 Zn.	8.299.	
[6] "	8.392.	
[7] "	8.488.	
[8] Cu_3 Zn_2.	8.224.	
[9] Cu Zn.	8.230.	
[10] "	7.808.	
[11] Cu_2 Zn_3.	7.939.	
[12] Cu Zn_2.	8.283.	
[13] "	7.859.	
[14] Cu_3 Zn_{17}.	7.721.	
[15] Cu_3 Zn_{18}.	7.836.	
[16] Cu_3 Zn_{19}.	8.019.	
[17] Cu_3 Zn_{20}.	7.603.	
[18] Cu_3 Zn_{21}.	8.058.	
[19] Cu_3 Zn_{22}.	7.882.	
[20] Cu_3 Zn_{23}.	7.443.	
[21] Cu Zn_3.	7.449.	
[22] "	7.736.	
[23] Cu Zn_4.	7.371.	
[24] "	7.445.	
[25] Cu Zn_5.	6.605.	
[26] "	7.442.	
CADMIUM AND LEAD.		
[27] Cd_6 Pb.	9.160, 13°7.	
[28] Cd_4 Pb.	9.353, 12.°	
[29] Cd_2 Pb.	9.755, 14°7.	
[30] Cd Pb.	10.246, 11°7.	
[31] Cd Pb_2.	10.656, 13°4.	
[32] Cd Pb_4.	10.950, 9°2.	
[33] Cd Pb_6.	11.044, 14°8.	

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Alloy.	Specific Gravity.	Melting Point.
LEAD AND ANTIMONY.		
[1] Sb_8 Pb.	7.214.	
[2] Sb_6 Pb.	7.361.	
[3] Sb_5 Pb.	7.432.	
[4] Sb_4 Pb.	7.525.	
[5] "	7.622.	
[6] Sb_3 Pb.	7.830.	
[7] Sb_2 Pb.	8.330.	
[8] "	8.201, 13°7.	
[9] "	8.233.	
[10] Sb Pb.	8.953.	
[11] "	8.989, 11°7.	
[12] "	8.999.	
[13] Sb_2 Pb_3.	9.502.	
[14] Sb Pb_2.	9.723.	
[15] "	9.811, 14°3.	
[16] "	9.817.	
[17] Sb_2 Pb_5.	10.040.	
[18] Sb Pb_3.	10.136.	
[19] "	10.144, 15°4.	
[20] "	10.211.	
[21] Sb_2 Pb_7.	10.344.	
[22] Sb Pb_4.	10.387.	
[23] "	10.455.	
[24] Sb_2 Pb_9.	10.541.	
[25] Sb Pb_5.	10.556.	
[26] "	10.586, 19°3.	
[27] "	10.615.	
[28] Sb_2 Pb_{11}.	10.673.	
[29] Sb Pb_6.	10.722.	
[30] Sb_2 Pb_{13}.	10.764.	
[31] Sb Pb_7.	10.802.	
[32] Sb Pb_{10}+	10.930, 19°9.	
[33] Sb Pb_{25}.	11.194, 20°5.	

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[33] Matthiessen. P.T.1860.177.

Alloy.	Specific Gravity.	Melting Point.
COPPER AND ANTIMONY.		
[1] Cu Sb	7.990.	
BISMUTH AND SILVER.		
[2] Bi_{200} Ag.	9.802, 23°5.	
[3] Bi_{50} Ag.	9.813, 23°6.	
[4] Bi_{24} Ag.	9.820, 23°3.	
[5] Bi_{12} Ag.	9.836, 21°8.	
[6] Bi_{6} Ag.	9.859, 21.°	
[7] Bi_{4} Ag.	9.899, 15°2.	
[8] Bi_{2} Ag.	9.966, 14°9.	
[9] Bi Ag.	10.068, 15°6.	
[10] Bi Ag_2.	10.197, 13°2.	
[11] Bi Ag_4.	10.323, 15°1.	
BISMUTH AND LEAD.		
[12] Bi_{60} Pb.	9.844, 21°7.	
[13] Bi_{48} Pb.	9.845, 21°6.	
[14] Bi_{40} Pb.	9.850, 21°3.	
[15] Bi_{24} Pb.	9.887, 20°6.	
[16] Bi_{20} Pb.	9.893, 19°5.	
[17] Bi_{16} Pb.	9.934, 21°1.	
[18] Bi_{12} Pb.	9.973, 15.°	
[19] Bi_{8} Pb.	10.048, 10°7.	
[20] Bi_{4} Pb.	10.235, 12°5.	
[21] «	10.232.	
[22] Bi_3 Pb.		122°4.
[23] Bi_8 Pb_3.		125°3.
[24] Bi_2 Pb.	10.538, 14.°	
[25] «	10.519.	
[26] Bi Pb.	10.956, 14°9.	
[27] «	10.931.	
[28] Bi_4 Pb_5.	11.038.	
[29] Bi_2 Pb_3.	11.108.	
[30] Bi_4 Pb_7.	11.166.	
[31] Bi Pb_2.	11.141, 12°7.	

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Alloy.	Specific Gravity.	Melting Point.
[1] Bi Pb_2.	11.194.	
[2] Bi_2 Pb_5.	11.209.	
[3] Bi Pb_3.	11.161, 14°8.	
[4] "	11.225.	
[5] Bi_2 Pb_7.	11.235.	
[6] Bi Pb_4.	11.188, 20°8.	
[7] Bi Pb_5.	11.196, 20°2.	
[8] Bi Pb_{12}.	11.280, 22°5.	
[9] Bi Pb_{50}.	11.331, 23.°	
BISMUTH AND COPPER.		
[10] Bi Cu.	9.634.	
BISMUTH AND ZINC.		
[11] Bi Zn.	9.046.	
BISMUTH AND CADMIUM.		
[12] Bi_{12} Cd.	9.766, 15°4.	
[13] Bi_8 Cd.	9.737, 14°7.	
[14] Bi_4 Cd.	9.669, 14°8.	
[15] Bi_2 Cd.		146°3.
[16] "	9.554, 13°4.	
[17] Bi Cd.	9.388, 15.°	
[18] Bi Cd_2.	9.195, 15°5.	
[19] Bi Cd_3.	9.079, 13°1.	
BISMUTH AND ANTIMONY.		
[20] Bi_6 Sb.	9.435, 9°4.	
[21] Bi_5 Sb.	9.369.	
[22] Bi_4 Sb.	9.276.	
[23] "	9.277, 12°1.	
[24] Bi_3 Sb.	9.095.	
[25] Bi_2 Sb.	8.859.	
[26] "	8.886, 14.°	
[27] Bi Sb.	8.392, 11.°	
[28] "	8.364.	
[29] Bi Sb_2.	7.829.	
[30] "	7.864, 9°4.	

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Alloy.	Specific Gravity.	Melting Point.
[1] $Bi\ Sb_3$.	7.561.	
[2] $Bi\ Sb_4$.	7.370.	
[3] $Bi\ Sb_5$.	7.271.	
GOLD AND SILVER.		
[4] $Ag_8\ Au$.	11.760, 13°1.	
[5] $Ag_4\ Au$.	12.257, 14°7.	
[6] $Ag_2\ Au$.	13.432, 14°3.	
[7] $Ag\ Au$.	14.870, 13.°	
[8] $Ag\ Au_2$.	16.354, 13.°	
[9] $Ag\ Au_4$.	17.540, 12°3.	
[10] $Ag\ Au_6$.	18.041, 13°1.	
GOLD AND LEAD.		
[11] $Pb_{10}\ Au$.	11.841, 23°3.	
[12] $Pb_5\ Au$.	12.274, 19°4.	
[13] $Pb_4\ Au$.	12.445, 21°6.	
[14] $Pb_3\ Au$.	12.737, 21°3.	
[15] $Pb_2\ Au$.	13.306, 22°1.	
[16] $Pb\ Au$.	14.466, 14°3.	
[17] $Pb\ Au_2$.	15.693, 14°5.	
[18] $Pb\ Au_4$.	17.013, 14°3.	
GOLD AND BISMUTH.		
[19] $Bi_{90}\ Au$.	9.872, 21.°	
[20] $Bi_{40}\ Au$.	9.942, 21°2.	
[21] $Bi_{20}\ Au$.	10.076, 18°7.	
[22] $Bi_8\ Au$.	10.452, 21°4.	
[23] $Bi_4\ Au$.	11.025, 23.°	
[24] $Bi_2\ Au$.	12.067, 16.°	
[25] $Bi\ Au$.	13.403, 16°5.	
[26] $Bi\ Au_2$.	14.844, 16.°	
TIN AND SILVER.		
[27] $Sn_{18}\ Ag+$.	7.421, 18°6.	
[28] $Sn_5\ Ag$.	7.551, 18°8.	
[29] $Sn_6\ Ag+$.	7.666, 18°4.	
[30] $Sn_3\ Ag+$.	7.963, 19°3.	

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[28] Holzmann. P. T. 1860. 177.
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Alloy.	Specific Gravity.	Melting Point.
[1] $Sn_2 Ag$+.	8.223, 16°3.	
[2] Sn Ag.	8.828, 13°8.	
[3] Sn Ag_2.	9.507, 12°9.	
[4] Sn Ag_4.	9.953. 14°8.	
TIN AND LEAD.		
[5] Sn_6 Pb.	7.9210.	
[6] "	7.927, 15°2.	
[7] Sn_3 Pb.	8.0279.	194.°
[8] "	8.093.	
[9] "	8.046.	
[10] Sn_4 Pb.	8.1730.	189.°
[11] "	7.850.	190.°
[12] "	8.188, 16.°	
[13] "	8.196.	
[14] "	8.2347.	187.°
[15] "	8.195.	
[16] Sn_3 Pb.	8.3914.	186.°
[17] "	8.549.	182°8.
[18] "		182°5.
[19] "		182°8.
[20] "	9.025.	
[21] "	8.418.	
[22] "	8.4087.	181.°
[23] "	8.414.	
[24] Sn_7 Pb_2.	8.291.	
[25] Sn_5 Pb_2.	8.565.	
[26] Sn_2 Pb.	8.7454.	196.°
[27] "	8.688.	182°8.
[28] "	8.779, 17°2.	
[29] "	8.774.	
[30] "	8.7257.	197.°
[31] "	8.766.	
[32] Sn_3 Pb_2.	9.0377.	210.°
[33] "	9.046.	

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[30] Pillichody. 14. 279.
[31] Riche. 15. 111.
[32] Pillichody. 14. 279.
[33] Riche. 15. 111.

Alloy.	Specific Gravity.	Melting Point.
[1] $Sn_7 Pb_5$.	9.2773, 15.°	184°5. rs. 181°9.
[2] Sn Pb.	9.4263.	241.°
[3] "	9.288.	182°2.
[4] "	9.394.	
[5] "	9.460, 15°5.	
[6] "	9.458.	
[7] "	9.4330.	235.°
[8] "	9.451.	
[9] $Sn_3 Pb_4$.	9.6399, 15.°	236.°
[10] $Sn_2 Pb_3$.	9.7971.	246.°
[11] $Sn Pb_2$.	10.0782.	
[12] "	9.966.	
[13] "	10.080, 14°8.	
[14] "	10.105.	
[15] "	10.0520.	270.°
[16] "	10.110.	
[17] $Sn Pb_3$.	10.3868.	289.°
[18] "	10.421.	
[19] "	10.3311.	283.°
[20] "	10.419.	
[21] $Sn Pb_4$.	10.5551.	
[22] "	10.590, 14°3.	
[23] "	10.587.	
[24] "	10.5957.	292.°
[25] $Sn Pb_5$.	10.751.	
[26] $Sn Pb_6$.	10.815, 15°6.	
TIN AND IRON.		
[27] $Fe Sn_2$.	7.446.	
[28] $Fe Sn_5$. Cryst. furnace product.	7.534.	
[29] $Fe_3 Sn$.	8.733.	
TIN AND COPPER.		
[30] $Sn_5 Cu$.	7.442.	
[31] "	7.517.	
[32] "	7.28.	

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[27] Nœllner. 13. 188.
[28] Rammelsberg.
[29] Lassaigne.
[30] Mallet. Ding. J. 85. 378.
[31] Calvert & Johnson. 12. 120.
[32] Riche. 21. 270.

Alloy.	Specific Gravity.	Melting Point.
[1] Sn_4 Cu.	7.472.	
[2] "	7.558.	
[3] "	7.31.	
[4] Sn_3 Cu.	7.447.	
[5] "	7.606.	
[6] "	7.44.	
[7] Sn_5 Cu_2.	7.652.	
[8] Sn_7 Cu_3. Cryst. furnace product.	6.994.	
[9] Sn_2 Cu.	7.387.	
[10] " Crystallized.	7.53.	
[11] "	7.738.	
[12] "	7.83.	
[13] Sn Cu.	8.056.	
[14] "	8.072.	
[15] "	7.992.	
[16] "	7.90.	
[17] Sn_2 Cu_3.	8.06.	
[18] Sn Cu_2.	8.416.	
[19] "	8.512.	
[20] "	8.533.	
[21] "	8.15.	
[22] Sn Cu_3.	8.539.	
[23] "	8.954.	
[24] "	8.91.	
[25] Sn Cu_4.	8.400.	
[26] "	8.948.	
[27] "	8.77.	
[28] Sn Cu_5.	8.575.	
[29] "	8.965.	
[30] "	8.62.	
[31] Sn Cu_6.	8.750.	
[32] "	8.65.	
[33] Sn Cu_7.	8.728.	
[34] "	8.72.	

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Alloy.	Specific Gravity.	Melting Point.
[1] $Sn\ Cu_8$.	8.459.	
[2] "	8.84.	
[3] $Sn\ Cu_9$.	8.462.	
[4] $Sn\ Cu_{10}$.	8.561.	
[5] "	8.832.	
[6] "	8.87.	
[7] $Sn\ Cu_{15}$.	8.825.	
[8] "	8.84.	
[9] $Sn\ Cu_{20}$.	8.793.	
[10] $Sn\ Cu_{25}$.	8.820.	
TIN AND ZINC.		
[11] $Sn_2\ Zn$.	7.235.	
[12] "	7.274.	
[13] $Sn\ Zn$.	7.115.	
[14] "	7.262.	
[15] $Sn\ Zn_2$.	7.096.	
[16] "	7.188.	
[17] $Sn\ Zn_3$.	7.180.	
[18] $Sn\ Zn_4$.	7.155.	
[19] $Sn\ Zn_5$.	7.140.	
[20] $Sn\ Zn_{10}$.	7.135.	
TIN AND CADMIUM.		
[21] $Sn_6\ Cd$.	7.434, 12°7.	
[22] $Sn_4\ Cd$.	7.489, 15.°	
[23] $Sn_2\ Cd$.	7.690, 12°9.	
[24] "		173°8.
[25] $Sn\ Cd$.	7.904, 13°2.	
[26] $Sn\ Cd_2$.	8.139, 11°1.	
[27] $Sn\ Cd_4$.	8.336, 14°5.	
[28] $Sn\ Cd_6$.	8.432, 15.°	
TIN AND ANTIMONY.		
[29] $Sn_{100}\ Sb$.	7.284, 20°2.	
[30] $Sn_{50}\ Sb$.	7.279, 20.°	

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Alloy.	Specific Gravity.	Melting Point.
[1] Sn_{20} Sb.	7.276, 19°4.	
[2] Sn_{10} Sb.	7.208, 18°5.	
[3] Sn_5+ Sb.	7.140, 19.°	
[4] Sn_3 Sb.	7.100, 10°6.	
[5] Sn_2 Sb.	7.023, 15°8.	
[6] Sn Sb.	6.929, 15°8.	
[7] Sn Sb_2.	6.844, 13°8.	
[8] Sn Sb_4.	6.781, 13°5.	
[9] Sn Sb_8.	6.747, 13°4.	
[10] Sn Sb_{12}.	6.739, 16°2.	
TIN AND BISMUTH.		
[11] Sn_{22} Bi.	7.438, 19°9.	
[12] Sn_4 Bi.	7.943, 20.°	
[13] Sn_7 Bi_2.	8.017.	
[14] Sn_3 Bi.	8.097.	
[15] "	8.112, 14°2.	
[16] Sn_2 Bi.	8.339, 13°9.	
[17] "	8.327.	
[18] Sn_5 Bi_2.	8.199.	
[19] Sn_3 Bi_2.	8.506.	
[20] Sn Bi.	8.772, 12°6.	
[21] "	8.754.	
[22] Sn_3 Bi_4.		136°4.
[23] Sn_2 Bi_3.		135°3.
[24] Sn Bi_2.	9.178, 15°9.	
[25] "	9.145.	
[26] Sn Bi_4.	9.435, 15.°	
[27] "	9.434.	
[28] Sn Bi_8.	9.614, 12°7.	
[29] Sn Bi_{12}.	9.675, 15°2.	
[30] Sn Bi_{20}.	9.737, 19°8.	
[31] Sn Bi_{60}.	9.774, 23.°	
[32] Sn Bi_{88}.	9.803, 22°8.	
[33] Sn Bi_{120}.	9.811, 19.°	

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Alloy.	Specific Gravity.	Melting Point.
[1] $Sn\ Bi_{180}$.	9.814, 19°5.	
[2] $Sn\ Bi_{400}$.	9.815, 18°1.	
TIN AND GOLD.		
[3] $Sn_{50}\ Au$.	7.441, 22°9.	
[4] $Sn_{15}\ Au$.	7.801, 22°8.	
[5] $Sn_9\ Au$.	8.118, 22°4.	
[6] $Sn_6\ Au$.	8.470, 23°1.	
[7] $Sn_4\ Au$.	8.931, 25°6.	
[8] $Sn_3\ Au$.	9.405, 23°7.	
[9] $Sn_5\ Au_2$.	9.715, 22°4.	
[10] $Sn_2\ Au$.	10.168, 23°7.	
[11] $Sn_3\ Au_2$.	10.794, 23°6.	
[12] $Sn\ Au$.	11.833, 14°6.	
[13] $Sn\ Au_2$.	14.244, 14°2.	
[14] $Sn\ Au_4$.	16.367, 15°4.	
ALLOYS OF ALUMINUM.		
[15] $Al_2\ Ag$.	6.733.	
[16] $Al\ Ag$.	8.744.	
[17] $Al\ Ag_2$.	9.376.	
[18] $Al\ Cr$.	4.9.	
[19] $Al_3\ Mn$.	3.402.	
[20] $Al_6\ Ni$.	3.647.	
[21] $Al_{44}\ Cu$.	2.764.	
[22] $Al_6\ Cu$.	3.206.	
[23] $Al_5\ Cu$.	3.316.	
[24] $Al_{11}\ Cu_3$.	3.579.	
[25] $Al_7\ Cu_2$.	3.724.	
[26] $Al_3\ Cu$.	3.972.	
[27] $Al_9\ Cu_4$.	4.148.	
[28] $Al_2\ Cu$.	4.355.	
[29] $Al\ Cu$.	5.731.	
[30] $Al\ Cu_2$.	6.946.	
[31] $Al\ Cu_3$.	7.204.	
[32] $Al\ Cu_4$.	7.534.	

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[29] Hirzel. 11. 138.
[30] Hirzel. 11. 138.
[31] Hirzel. 11. 138.
[32] Hirzel. 11. 138.

Alloy.	Specific Gravity.	Melting Point.
[1] $Al\ Cu_5$.	7.727.	
[2] $Al\ Cu_6$.	7.751.	
[3] $Al_2\ Cu_{13}$.	7.884.	
[4] $Al_4\ W$.	5.58.	
[5] Al Zn.	4.532.	
[6] $Al_6\ Sn$.	3.583.	
[7] $Al_5\ Sn$.	3.791.	
[8] $Al_4\ Sn$.	4.025.	
[9] $Al_3\ Sn$.	4.276.	
[10] $Al_2\ Sn$.	4.744.	
[11] Al Sn.	5.454.	
[12] $Al\ Sn_2$.	6.264.	
[13] $Al\ Sn_3$.	6.536.	
[14] $Al_3\ Nb$.	4.45—4.52.	
[15] $Al_3\ Ta$.	7.02.	
ALLOYS OF MERCURY. AMALGAMS.		
[16] Hg Pb.	11.93.	
[17] "	12.284, 15°7.	
[18] $Hg\ Pb_2$.	11.979, 15°9.	
[19] $Hg_2\ Pb$.	12.815, 15°5.	
[20] $Hg_5\ Cd_2$.	12.615.	
[21] Hg Zn.	11.304.	
[22] Hg Bi.	11.208.	
[23] $Hg\ Bi_2$.	10.693.	
[24] "	10.45.	
[25] $Hg\ Bi_3$.	10.474.	
[26] $Hg\ Bi_4$.	10.350.	
[27] $Hg\ Bi_5$.	10.240.	
[28] $Hg_2\ Au$.	15.412.	
[29] $Hg_2\ Sn$.	11.3816.	
[30] "	11.456, 11°3.	
[31] Hg Sn.	10.3447.	
[32] "	10.369, 14°2.	
[33] "	10.255.	

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Alloy.	Specific Gravity.	Melting Point.
[1] $Hg\ Sn_2$.	9.3185.	
[2] "	9.362, 9°9.	
[3] "	9.314.	
[4] $Hg\ Sn_3$.	8.8218.	
[5] "	8.805.	
[6] $Hg\ Sn_4$.	8.510.	
[7] $Hg\ Sn_5$.	8.312.	
[8] $Hg\ Sn_6$.	8.151.	

2d. ALLOYS OF MORE THAN TWO METALS.

Alloy.	Specific Gravity.	Melting Point.
[9] $Cd\ Pb_3\ Bi_4$.	10.563.	89°5.
[10] $Cd_2\ Pb_7\ Bi_8$.	10.732.	95.°
[11] $Zn\ Pb_2\ Sn_9$.		168.°
[12] $Pb\ Sn\ Bi_3$.		96.°
[13] $Pb\ Sn_2\ Bi_2$.		145.°
[14] $Cu_3\ Ni\ Sb_3$. Furnace product.	8.004.	
[15] $Cd\ Sn\ Pb\ Bi_2$	9.765.	68°5.
[16] $Cd\ Sn_2\ Pb_2\ Bi_4$.	9.784.	68°5.
[17] $Cd_3\ Sn_4\ Pb_4\ Bi_8$.	9.725.	67°5.
[18] $Cd_4\ Sn_5\ Pb_5\ Bi_{10}$.	9.685.	65°5.

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Those who wish further details concerning Alloys and Amalgams, can find copious information in "Watts' Dictionary of Chemistry," under the headings of the various metals.

For many Amalgams, see Joule, Journ. Chem. Soc., 1863, vol. 16.

For Alloys of Pt. and Au., see Prinsep, Phil. Trans., 1828.

XXXIX. Hydrocarbons.

1st. SERIES OF ALCOHOL RADICLES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Propyl, or trityl.	$(C_3 H_7)_2$.	.6745, 18.°	68.°	
[2] " Di-iso-propyl.	"	.6769, 10.°		
[3] " "	"	.6701, 17°.5.	58.°	
[4] " "	"	.6569, 29.°		
[5] " Hexane.	"	.6630, 17.°	69°—71°.	
[Compare propyl with hexyl hydride.]				
[6] Ethyl butyl.	$C_2 H_5 . C_4 H_9$.	.7011, 0.°	62.°	
[7] Ethyl amyl.	$C_2 H_5 C_5 H_{11}$.	.7069, 0.°	88.°	
[8] " "	"	.6819, 17°.5.	90°—91.°	
[9] " "	"	.6795, 20.°		
[10] " "	"	.6833, 18°.4.	90.°	
[11] Methyl caproyl.	$C H_3 . C_6 H_{13}$.		82.°	
[12] " "	"	6789, 19.°	89°—91.°	
[13] Butyl, or tetryl.	$(C_4 H_9)_2$.	6940, 18.°	108.°	
[14] "	"	.7057, 0.°	106.°	
[15] "	"	.728		
[16] "	"	.7135, 0.°	109.	
[17] "	"	.7001, 16°.4.		
[18] "	"	.6945, 18.°	119.°	
[19] "	"	.7083, 12°.5.	124.°	
[20] " Octane.	"	.7032, 17.°	123°–125.°	
[21] " Isobutyl.	"	.723, 0.°	127.°	
[22] " "	"	.721, 10.°		
[23] Amyl isopropyl.	$C_3 H_7 . C_5 H_{11}$.	.698, 16°.5.	109°–110.°	
[24] " "	"	.6712, 49.°		
[25] Butyl amyl.	$C_4 H_9 C_5 H_{11}$.	.7247, 0°.	132.°	
[26] Amyl.	$(C_5 H_{11})_2$.	.7704, 11.°	155.°	

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[26] Frankland. 3. 479.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Amyl.	$(C_5 H_{11})_2$.	.7413, 0.°	158.°	
[2] "	"	.7282. 20.°		
[3] "	"	.7365, 18.°	159.°	
[4] Butyl hexyl.	$C_4 H_9 . C_6 H_{13}$.		155.°	
[5] Hexyl, or caproyl.	$(C_6 H_{13})_2$.		202.°	
[6] "	"	.7574, 0.°	202.°	
[7] "	"	.7568, 18.°	202.	
[8] " Dodecane.	"	.7738, 17.°	201.°	

2d. HYDRIDES OF ALCOHOL RADICLES.

Compare with Isomers among the Radicles themselves.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[9] Propyl hydride.	$C_3 H_7 . H$.	.613,—25.°	−25°to—30°.	
[10] Butyl "	$C_4 H_9 . H$.	.600, 0.°	a. 0.°	
[11] " "	"	.600, 0.°	0°–4.	
[12] " "	"	.624,—1.°	a. 0.°	
[13] Amyl "	$C_5 H_{11} . H$.	.6413, 11°2.	30.°	
[14] " "	"	.6385, 14°2.	734. m. m.	
[15] " "	"	.636, 17.°	39°—40.°	
[16] " "	"	.6263, 17.°	34.°	
[17] " "	"	.628.18.°	30.°	
[18] Hexyl " Alpha.	$C_6 H_{13} . H$.	.668, 0.°	58.°	
[19] " " "	"	.678, 15°5.	68°—70.°	
[20] " " "	"	.669, 16.°	68.°	
[21] " " "	"		60°—64.°	
[22] " "	"		68°5.	
[23] " " Beta.	"	.6645, 16°5.	68°5—70.°	
[24] " " (?)	"	.6617, 17°5.	69°5.	
[25] " " (?)	"	.676, 0°.	61°3.	
[26] " " (?)	"	.689, 0.°	68°5.	
[27] " " Isomer.	"	.671, 26.°	78.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Heptyl hydride.	$C_7 H_{15}$. H.	.7259, 0.°		
[2] " "	"	.7148, 15.°	90°—92.°	
[3] " "	"	.6999, 32.°		
[4] " "	"	.6867, 48.°		
[5] " "	"	.709, 17°5.	98°—99.°	
[6] " "	"	.7122, 16.°	98.°	
[7] " "	"	.699, 16.°	92°—94.°	
[8] " "	"	.6851, 17°5.	98°—99.°	
[9] " "	"	.6840, 20°5.	100°5.	
[10] " "	"	.7085, 0.°	97°8.	
[11] Octyl "	$C_8 H_{17}$. H.	.719, 17°5.	119°—120.°	
[12] " "		.726, 15.°	116°—118.°	
[13] " "	"	.728, 0.°	115°—118.°	
[14] Nonyl hydride.	$C_9 H_{19}$. H.	.741.	136°—138.°	
[15] Decatyl "	$C_{10} H_{21}$. H.	.757, 16.°	158°—162.°	
[16] " "	"	.753, 0.°	155°—157.°	
[17] Endecatyl hydride.	$C_{11} H_{23}$. H.	.766.	180°—182.°	
[18] Duodecatyl "	$C_{12} H_{25}$. H.	.778, 20.°	196°—200.°	
[19] _____ "	$C_{13} H_{27}$. H.	.796, 17.°	218°—220.°	
[20] _____ "	$C_{14} H_{29}$. H.	.809, 20.°	236°—240.°	
[21] _____ "	$C_{15} H_{31}$. H.	.825, 19.°	258°—262.°	

3d. METHYLENE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[22] Butylene.	$C_4 H_8$.	.739, 0.°	12°—14.°	
[23] Amylene.	$C_5 H_{10}$.		39.°	
[24] "	"		42.°	
[25] "	"		a. 35.	
[26] "	"	.6517, 16°5.		
[27] "	"	.6633, 0.°	35.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Amylene.	$C_5 H_{10}$.	.66277, 0.°	30°, to 35°5.	
[2] "	"	.65490, 10.°		
[3] "	"	.64450, 17.° m. of 4.		
[4] "	"	.62384, 33.° m. of 2.		
[5] "	"	.625812, 33°5. m. of 2.		
[6] "	"	.62634, 35°5. m. of 2.		
[7] "	"	.679, 0.°	28°–30.°	
[8] Diamylene.	$(C_5 H_{10})_2$.	.7777, 0.°	165.°	
[9] " (?)	"	.8416, 0.°	150°–153.°	
[10] "	"	.8248, 20.°		
[11] Triamylene.	$(C_5 H_{10})_3$.	.8139.	245°–248.°	
[12] Tetramylene.	$(C_5 H_{10})_4$.	.8710, 0.°	390°–400.°	
[13] Hexylene.	$C_6 H_{12}$.		71.°	
[14] "	"	.709, 12.°	68°–70.°	
[15] "	"		68°–70.°	
[16] "	"		68°–72.°	
[17] "	"	.6937, 0.°	68°–70.°	
[18] "	"	.6986, 0.°		
[19] "	"	.702, 0.°	68°–71.°	
[20] "	"		64°–65.°	
[21] Heptylene.	$C_7 H_{14}$.	.718, 18.°	99.°	
[22] " Two	"	.7060, 12°5.	93°–95.°	
[23] " preparations.	"	.7026, 19°5.	95°–97.°	
[24] " (?)	"	.6985, 14.°	81°–83.°	
[25] "	"		94°1.	
[26] "	"	.7060, 16.°	91.°	
[27] Octylene.	$C_8 H_{16}$.	.708, 16.°	106°–110.°	
[28] "	"	.723, 17.°	125°, 760.m.m.	
[29] "	"	.737, 20.°	122°–125.°	
[30] "	"		115°–117.°	
[31] "	"		118°–120.°	
[32] "	"	.7396, 0.°	125°2.	
[33] Meta-octylene.	$(C_8 H_{16})_{2\cdot(?)}$	.814, 15.°	a. 250.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Nonylene.	$C_9 H_{18}$.	.757, 20°5.	144°–146.°	
[2]	«		a. 140.°	
[3] «	«	.7618, 0.°	153.°	
[4] Decatylene. } From differ-	$C_{10} H_{20}$.	.7912, 0.°	174°6.	
[5] « } ent sources.	«	.823, 0.°	175°8.	
[6] Endecatylene.	$C_{11} H_{22}$.	.782, 0.°	195°8.	
[7] « } From differ-	«	8398, 0.°	195°9.	
[8] « } ent sources.	«	.791, 0.°	195°2.	
[9] «	«		192°–193.°	
[10] Duodecatylene.	$C_{12} H_{24}$.	.791, 0.°	216°2.	
[11] « } From differ-	«	.8361.	212°6.	
[12] « } ent sources.	«	.8654–.8543, 0.°	208°–219.°	
[13] Tridecatylene.	$C_{13} H_{26}$.	.8445, 0.°	230°–231.°	
[14] Cetene. l.	$C_{16} H_{32}$.		275.°	
[15] «	«	.7893, 15°2.		
[16] Cerotene. s.	$C_{27} H_{54}$.	.861, 15.°		
[17] «	«			57°–58.°
[18] Melene. s.	$C_{30} H_{60}$.	.89.		
[19] «	«			62.°
[20] Etherol. Polymer of C_2H_4	$(C_2 H_4)n$.	.9174.		
[21] « « «	«	.921.	280.°	

4th. BENZOL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[22] Benzol.	$C_6 H_6$.	.85, 15°5. l. } .956,—18.° s. }	86.°	5°5.
[23] «	«			
[24] «	«	85.	86.°	7.°
[25] «	«	.85.	80°—81.°	
[26] «	«	.89911, 0.° m. of 2. }		
[27] «	«	.88372, 15°2. }	80°4.	
[28] «	«	.88354, 15°3. }	760. m. m.	
[29] «	«		82.°	s. 3.°

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Benzol.		$C_6 H_6$.	.8841, 15.°		
[2] «		«	.8667.	80°8.	
[3] «	Parabenzol.	«	.8469	97°5.	
[4] «	From coal tar	«	.8957, 0.°	80°1.	
[5] «	naphtha.	«	.8820, 15°5.		
[6] «		«	.895, 3.°	80°5.	3.°
[7] «		«	.812, 80°5.		
[8] «		«	.8995, 0.°		
[9] «		«	.8890, 10.°		
[10] «		«	.8784, 20.°		
[11] «		«	.8568, 40.°		
[12] «		«	.8349, 60.°		
[13] «		«	.8126, 80.°		
[14] Toluol.		$C_7 H_8$.		114.°	
[15] «		«	.87.	108.°	
[16] «		«		110°5.	
[17] «		«		111.°	
[18] «		«	.8650.	103°7.	
[19] «	Paratoluol.	«	.8333.	119°5.	
[20] «		«	.8824, 0.°	110°3.	
[21] «		«	.8720, 15.°		
[22] «	Methyl phenyl.	«	.881, 5.°	111.°	
[23] «		«	.8841, 0.°		
[24] «		«	.8657, 20.°		
[25] «		«	.8375, 50.°		
[26] «		«	.8086, 80.°		
[27] «		«	.7889, 100.°		
[28] Xylol.		$C_8 H_{10}$.		128°–130.°	
[29] «		«	.8309, 15.°		
[30] «		«		126°2.	
[31] «		«		140.°	
[32] «	From coal tar	«	.878, 0.°	139°8.	
[33] «	naphtha.	«	.866, 15.°		

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[30] Church. P. M. (4). 9. 256.
[31] Müller. 17. 424.
[32] Warren. 18. 515. [33] Warren. 18. 515.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Xylol.	$C_8 H_{10}$.		135.°	
[2]	" Ethyl phenyl.	"		133.°	
[3]	"	"	.8668, 21.°	139.°	
[4]	" Methyl benzyl.	"	.8621, 19°.5.	139°–140.°	
[5]	" Isoxylol.	"		137°–138.°	
[6]	"	"		142°–142°.5.	
[7]	"	"	.8770, 0.°		
[8]	"	"	.8600, 20.°		
[9]	"	"	.8340, 50.°		
[10]	"	"	.8073, 80.°		
[11]	"	"	.7892, 100.°		
[12]	" Ethyl benzol.	"	.8664, 22°.5.	134.°	
[13]	Cumol.	$C_9 H_{12}$.		144.°	
[14]	"	"		148.°	
[15]	"	"	.87.		
[16]	"	"		153.°	
[17]	"	"		148°.4.	
[18]	" From phorone.	"	.863, 13.°	170°–175.°	
[19]	" From coal tar	"	.8643, 0.°	169°.8.	
[20]	" naphtha.	"	.8530, 15.°		
[21]	" From oil of	"	.8792, 0.°	151°.1.	
[22]	" cummin.	"	.8675, 15.°		
[23]	" Methyl xylol.	"		165°–166.°	
[24]	" From coal tar.	"		166.°	
[25]	Cymol.	$C_{10} H_{14}$.	.860, 14.°	175.°	
[26]	"	"	.857, 16.°	171°.5.	
[27]	"	"		175.°	
[28]	"	"	.8778, 0.°	177°.5.	
[29]	"	"	.8678, 12°.6.	743.7 m. m.	
[30]	"	"		171.°	
[31]	"	"		170°.7.	
[32]	"	"	.8660, 15.°		

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[31] Church. P. M. (4). 9. 256.
[32] Mendelejeff. 13. 7.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cymol.	$C_{10}H_{14}$.	.8664, 20.°		
[2] « From oil of cummin.	«	.8697, 0.°	179°5.	
[3] « From oil of cummin.	«	.8724. 0.°		
[4] « From oil of cummin.	«	.8592, 14.°		
[5] « From camphor and PCl_5.	«	.8705, 0.°	175°–176.°	
[6] « From camphor and PCl_5.	«	.8544, 20.°		
[7] « From camphor and PCl_5.	«	.8302, 50.°		
[8] « From camphor and PCl_5.	«	.7893, 100.°		
[9] « From camphor and PCl_5.	«	.8732, 0.°	174°–175.°	
[10] « From camphor and PCl_5.	«	.8574, 20.°		
[11] « From camphor and PCl_5.	«	.8333, 50.°		
[12] « From camphor and PCl_5.	«	.7919, 100.°		
[13] « From camphor.	«		175°–178.°	
[14] « Thymo-cymol.	«		173.°	
[15] « Ethyl xylol.	«	.8783, 20.°	183°–184.°	
[16] « Diethyl benzol.	«	.8707, 15°5.	178°–179.°	
[17] « Isobutyl benzol.	«	.8577, 16.°	159°–161.°	
[18] « Tetra methyl benzol	«		189°–191.°	78–80.°
[19] Amyl benzol.	$C_{11}H_{16}$.	.859, 12.°	195.°	
[20] Diethyl toluol.	«	.8751, 0.°	178.°	
[21] Laurol.	«	.887, 10.°	188.°	
[22] Amyl toluol.	$C_{12}H_{18}$.	.8643, 9.°	213.°	
[23] Amyl xylol,	$C_{13}H_{20}$.	.8951, 9.°	232°–233.°	
[For mesitylene, see miscellaneous hydrocarbons.]				

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[7] Louguinine. 30.

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For many other determinations taken between 0° and 100°, see original paper.

[9] Louguinine. 30.

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5th. C_{10} H_{16} AND ITS ISOMERS.

Chiefly Hydrocarbons from Essential Oils.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[For valerylene and isoprene, see miscellaneous hydrocarbons.]				
[1] From oil of anise.	C_{10} H_{16}.	.8580, 20.°	160.°	
[2] Geraniene.	"	.842–.843, 20.°	162°–164.°	
[3] From oil of neroli.	"	.8466, 20.°	173.°	
[4] " " petit grain.	"	.8470, 20.°	174.°	
[5] " " orange peel.	"	.8460, } 20.°	174.°	
[6] " " " "	"	.8468, }		
[7] " fruit of Citrus lumia.	"	.853, 18.°	180.°	
[8] " " " bigaradia.	"	.8520, 10.° }	178.°	
[9] " " " "	"	.8517, 12.° }		
[10] " " " medica. }	"	.8514, 15.°	55. (?)	
[11] " oil of cedrat. }	"	.8466, 20.°	173.°	
[12] " " bergamot.	"	.8464, } 20.°	175°–176.°	
[13] " " "	"	.8466, }		
[14] " " lemon.	"	.84,–.86.		
[15] " " "	"		173.°	
[16] " " "	"		176°1.	
[17] " " "	"	.8380, 0.° }		
[18] " " "	"	.8661, 0.° }		
[19] " " "	"	.8468, 20.	173.°	
[20] Citrene.	"	.8569.	165.°	
[21] Cicutene. Fr. Cicuta virosa.	"	.87038, 18.°	166.°	
[22] From oil of parsley.	"	.8732, 20.°	160.°	
[23] " " cummin.	"	.8772, 0.° }	155°8.	
[24] " " "	"	.8657, 15.° }		
[25] " " galbanum.	"	.8842, 9.°	160.°	
[26] " " caraway.	"	.8466, 20.°	176.°	
[27] Carvene.	"	.861, 15.°	175°–178.°	
[28] "	"	.8530, } 20.°	166.°	
[29] "	"	.8545, }		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] From oil of dill.	$C_{10}H_{16}$.	.8467, 20.°	173.°	
[2] " " elder.	"	.8468, 20.°	172.°	
[3] Safrene.	"	.8345, 0.°	155°–157.°	
[4] From oil of wormwood.	"	.8565, 20.°	160.°	
[5] " " mint.	"	.8600, 20.°	160.°	
[6] " " peppermint.	"	.8602, 20.°	175.°	
[7] " " thyme.	"	.8635, 20.°	160.°	
[8] Thymene.	"	.868, 20.°	160°–165.°	
[9] Gaultherilene.	"	.8510, 20.°	168.°	
[10] From oil of rosemary.	"	.8805, 20.°	163.°	
[11] Cinaëbene.	"	.878.	172.°	
[12] Cynene.	(?) "	.825, 16.°	173°–175.°	
[13] From oil of nutmegs.	"	.8518	166°–167.°	
[14] " " "	"	.8527 20.°		
[15] " " bay.	"	.908, 15.°	164.°	
[16] " " "	"	.8508, 20.	171.°	
[17] " " birch tar.	"	.870, 20.°	156.°	
[18] " " cascarilla.	"	.8467, 20.°	172.°	
[19] " " myrtle.	"	.8690, 20.°	163.°	
[20] " laurel turpentine.	"	.8618, 20.°	160.°	
[21] " Eucalyptus amygdalina.	"	.8642, 20.°	171.°	
[22] " Ptychotis ajowan.	"	.854, 12.°	172.°	
[23] " elemi.	"	.849, 11.°	174.°	
[24] " "	"	.852, 24.°	166.°	
[25] Olibene.	"	.863, 12.°	156°–158.°	
[26] Cajeputene.	"	.850, 15.°	160°–165.°	
[27] Isocajeputene.	"	.857, 16.°	176°–178.°	
[28] By distillation of copal oil.	"	.951, 10.°	160°–165.°	
[29] Caoutchin.	"	.842, 20.°	171.°	
[30] Tolene.	"	.858, 10.°	154°–160.°	
[31] "	"		170.°	
[32] Xanthoxylene.	"		162.°	
[33] From Pinus maritima.	"	.864, 16.°	80°–100.°	
[34] " " pumilis.	"	.875, 17.°	161.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] From Pinus picea.	C_{10} H_{16}.	.859, 6.°	168°–173.°	
[2] " " abies.	"	.856, 20.°	167.°	
[3] " Abies Reginæ Amaliæ.	"	.868.	156°–192.°	
[4] Oil of turpentine.	"	.8902, 0.°		
[5] " "	"	.880.	165.°	
[6] " " Four samples.	"	.8644.		
[7] " "	"	.8555.	20.°	
[8] " "	"	.8614.		
[9] " "	"	.8600.		
[10] Terebene.	"	.8718.	171.°	
[11] "	"	.864.	156.°	
[12] "	"		160.°	
[13] "	"	.8583, 20.°	160.°	
[14] Isoterebenthene.	"	.8432, 22.°	176°–178.°	
[15] Austrapyrolene.	"	.847.	177.°	
[16] Terebilene.	"	.843.	134.°	
[17] Camphilene.	"	.87.	156.°	
[18] Sesquiterebene.	C_{15} H_{24}.		250.°	
[19] Metatemplene.	"	1.037, 4.°	280.°	
[20] Para-copaiva oil.	"	.91.	252.° p. d.	
[21] From Maracaibo balsam.	"	.921, 10.°	250°–260.°	
[22] " Gurgun "	"	.9044, 15.°	255.°	
[23] " Drybalanops camphora.	"	.9—.921, 20.°	255°–270.°	
[24] " oil of cloves.	"	.918, 18.°	142°–143.°	
[25] " " "	"	.9016, 14.°	251.°	
[26] " " "	"	.9041, 20.°	249.°	
[27] " " cubebs.	"	.915; 930; 938.	250.°	
[28] " " "	"	.929.	250°–260.°	
[29] " " "	"	.9062, 20.°	260.°	
[30] " Myrtus pimenta.	"	.98, 8.°	255.°	
[31] " Laurus nobilis.	"	.925, 15.°	250.°	
[32] " oil of rosewood.	"	.9042, 20.°	249.°	
[33] " " calamus.	"	.9180,	260.°	
[34] " " "	"	.9275, 20.°		

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[33] Gladstone. C. S. J. 17. 1.
[34] Gladstone. C. S. J. 17. 1.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] From oil of cascarilla.	$C_{15}H_{24}$.	.9212, 20.°	254.°	
[2] " " patchouli.	"	.9211,	254.°	
[3] " " "	"	.9278, 20.°	257.°	
[4] " " "	"	.9255,	260.°	
[5] Diterebene.	$C_{20}H_{32}$.	.94.	310°–315.°	
[6] Metaterebenthene.	"	.913, 20.°	a. 360.°	
[7] Colophene.	"	.9391, 20.°	315.°	
[8] "	"	.94.	310.°	
[9] Heveéne.	"	.921, 21.°	315.°	

6th. MISCELLANEOUS HYDROCARBONS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[10] Diallyl.	$(C_3H_5)_2$.	.684, 14.°	59.°	
[11] "	"	.68724, 17.° m. of 4.	58°	
[12] "	"	.64682, 59°5. m. of 2.	to	
[13] "	"	.64564, 58.° m. of 2.	59°5.	
[14] Hexoylene.	C_6H_{10}.	.710, 13.°	76°–80°	
[15] Carbo dimethyl diethyl.	C_7H_{16}.	.7111, 0.°	86°–87.°	
[16] " " "	"	.6958, 20°5.		
[17] Cinnamene, or Styrol.	C_8H_8.	.928, 15.°	144.°	
[18] " " "	"	.924.	145°75.	
[19] " " "	"	.876–.896, 16.°	140.°	
[20] Metacinnamene.	"	1.054, 13.° s.		
[21] Valerylene.	C_5H_8.		44°–46.°	
[22] "	"	.69999, 0.°		
[23] "	"	.687386, 17.° m. of 2.	41°–42.°	
[24] "	"	.65719, 41.° m. of 2.		
[25] "	"	.65082, 42.°		
[26] Trivalerylene.	$(C_5H_8)_3$.	.862, 15.°	265°–275.°	
[27] Isoprene.	C_5H_8.	.6823, 20.°	37°–38.°	
[28] Valylene.	C_5H_6.		a. 50.°	

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[26] Reboul. 20. 585.
[27] Williams. 13. 495.
[28] Reboul. 18. 510.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethyl vinyl.	$C_4 H_8$.		—5.°	
[2] Caoutchene.	"	.65,—2.°	14°5.	—10.°
[3] Menthene.	$C_{10} H_{18}$.	.851, 21.°	163.°	
[4] "	"		163.°	
[5] Rutylene.	"		a. 150.°	
[6] Crotonylene.	$C_4 H_6$.		18.°	
[7] Conylene.	$C_8 H_{14}$.	.76076, 15.°	126.°	
[8] From Camphoric acid.	"	.814, 0.°	119.°	
[9] Benylene.	$C_{15} H_{28}$.	.9114, 0.°	223°–228.°	
[10] Eucalyptene.	$C_{12} H_{18}$.	836, 12.°	165.°	
[11] Camphin.	$C_{18} H_{32}$.	827, 25.°	167°–170.°	
[12] Cedrene.	$C_{16} H_{24}$.	.984, 14°5.	248.°	
[13] Mesitylene.	$C_9 H_{12}$.		155°–160.°	
[14] "	"		162°–164.°	
[15] "	"		163.°	
[16] Dibenzyl.	$C_{14} H_{14}$.		284.°	s. 51°5–52°5.
[17] "	"	1.002, 14.°	282.°	
[18] "	"	.9945, 10°5.	272.°	
[19] "	"			52°5–53°5.
[20] Naphthaline. l.	$C_{10} H_8$.	.9774, 79°2. m. of 3.	216°4–216°8.	79°2.
[21] " l.	"	.9628, 99°2.		79°91.
[22] "	"		212.°	79.°
[23] "	"		221.°	
[24] " s.	"	1.15173, 19.°		
[25] " s.	"	1.153, 18.°		
[26] " s.	"	1.048.		
[27] " [dride.	"			81.°
[28] Naphthaline tetrahy-	$C_{10} H_{12}$.	.981, 12.°	205.°	
[29] Methyl naphthaline. l.	$C_{11} H_{10}$.	1.0287, 11°5.	231°–232.°	
[30] Ethyl " l.	$C_{12} H_{12}$.	1.0184, 10.°	251°–252.°	
[31] Anthracene.	$C_{14} H_{10}$.		300°+.	180.°
[32] "	"	1.147.		
[33] "	"			213°3.

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Anthracene.	$C_{14}H_{10}$.		360°+.	213.°
[2] Anthracene dihydride.	$C_{14}H_{12}$.		305.°	106.°
[3] " hexhydride.	$C_{14}H_{16}$.		290.°	63.°
[4] Stilbene.	$C_{14}H_{12}$.			125.°
[5] "	"			115°–118.°
[6] Pyrene.	$C_{16}H_{10}$.			170°–180.°
[7] "	"			142.°
[8] Chrysene.	$(C_6H_4)_n$.			230°–235.°
[9] Paranicene.	$C_{10}H_{12}$.	1.24.	365.°	
[10] Retene.	$C_{18}H_{18}$.			98°–99.°
[11] Könlite.	$(C_6H_6)_n$.	.88.		107°5.
[12] "	"			114.°
[13] Scheererite.	$(CH_4)_n$.	1.0–1.2.	near 100.°	44.°
[14] Hartite.	$(C_5H_5)_n$.	1.046.		74.°

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XL. Compounds Containing C H, and O.

1st. ALCOHOLS OF THE ETHYLIC SERIES.

Note.—For common alcohol there is such a great number of determinations, both of Specific Gravity and Boiling Point, that the compiler has not thought it necessary or advisable to attempt to give them all. Therefore only the more important determinations for this substance are given.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl alcohol.	$C H_4 O$.	.798, 20.°	66°5.	
[2] " "	"		60°,744 m.m.	
[3] " "	"	.807, 9.°		
[4] " "	"	.813.		
[5] " "	"	.82074, 0.°	66°3.	
[6] " "	"	.7938, 25.°		
[7] " "	"	.81796, 0.°	65°5.	
[8] " "	"	.80307, 16°9.		
[9] " "	"		65°8.	
[10] " "	"		66°5.	
[11] " "	"	.8065, 15.°		
[12] " "	"	.8052, 9°5.	60°5.	
[13] " "	"	.8142, 0.°		
[14] " "	"	.7997, 16°4.		
[15] " "	"	.8574, 21.°	66°–66°5.	
[16] " "	"	.81571, 10.°	58°6.	
[17] Ethyl "	$C_2 H_6 O$.	.7924, 17°9.	78°4.	
[18] " "	"	.7915, 18.°	76.°	
[19] " "	"	.8095, 0.°	78°1–79.°	
[20] " "	"	.7996, 15.°	78°8.	
[21] " "	"	.81087, 0.°		
[22] " "	"	.8095, 0.°	78°4.	
[23] " "	"	.79821, 14.°		
[24] " "	"	.7990, 14°8.		

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[9] Andrews. 1. 89.
[10] Person. 1. 91.
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[24] Kopp. 13.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Ethyl alcohol.	C_2H_6O.	.8151, 0.°	78°3.	
[2]	" "	"		77°9.	
[3]	" "	"		78°4.	
[4]	" "	"	.7938, 15°5.	80°6.	
[5]	" "	"	.7897. } 21.°		
[6]	" "	"	.7905. }		
[7]	" "	"	.79381, 15°6.		
[8]	" "	"	.809, 5.°	78°25.	
[9]	" "	"	.8194, 19.°	81.°	
[10]	" "	"	.6796, 130°9.		
[11]	" "	"	.7947, 15.°		
[12]	" "	"	.7946. } 15.°,		
[13]	" "	"	.7947. }		
[14]	" "	"	.80625, 0.°		
[15]	" "	"	.80207, 5.°		
[16]	" "	"	.79788, 10.°	78°3.	
[17]	" "	"	.79367, 15.°	to	
[18]	" "	"	.78945, 20.°	78°307.	
[19]	" "	"	.78522, 25.°		
[20]	" "	"	.78096, 30.°		
[21]	" "	"	.8086, 19.°	77°–77°5.	
[22]	Propyl " iso.	C_3H_8O.	.791, 15.°	83°–84.°	
[23]	" " "	"	.7915, 16°5.	83°–85.°	
[24]	" "	"	.820, 0.°		
[25]	" "	"	.812, 10°3.		
[26]	" "	"	.780, 51°1.	98°5.	
[27]	" "	"	.749, 84.°		
[28]	" "	"	.813, 13.°	97°–101.°	
[29]	" "	"	.812, 16.°	97°–98.°	
[30]	" "	"	.823, 0.°	96.°	
[31]	" "	"	.8205, 0.°	96°–97.°	
[32]	Butyl "	$C_4H_{10}O$.	.8032, 18°5.	109.°	
[33]	" "	"	.817, 0.° }	107°5.	
[34]	" "	"	.809, 11.° }		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Butyl alcohol.	$C_4H_{10}O$.	.774. 55.°	107°5.	
[2]	" "	"	.732, 100.°		
[3]	" "	"	.8055, 16°8.	108°5.	
[4]	" "	"	.826, 0.°	115°–116.°	
[5]	" "	"	.8239, 0.°		
[6]	" "	"	.8105, 20.°		
[7]	" "	"	.7994, 40.°	116.°	
[8]	" "	"	.7738, 98°7.		
[9]	" "	"	.7735, 98°9.		
[10]	" " iso.	"	.85, 0.°	96°–98.°	
[11]	" " "	"	.827, 0.°	99.°	
[12]	" " "	"	.810, 22.°		
[13]	" " "	"	.8003, 18.°	108°39.	
[14]	Amyl "	$C_5H_{12}O$.	.8184, 15.°	132.	
[15]	" "	"	.8137, 15.°	133.°	
[16]	" "	"	.8271, 0.°	131°8.	
[17]	" "	"	.8185, 15.°	134.°	
[18]	" "	"	.8144, 15°9.		
[19]	" "	"	.8145, 16°4.	131°1.	
[20]	" "	"	.8127, 16°4.	760. m. m.	
[21]	" "	"	.8253, 0.° mean.		
[22]	" "	"		132.°	
[23]	" "	"	.818, 14.°	132.°	
[24]	" "	"		127°–129.°	
[25]	" "	"	.8248, 0.°	130°9–131°6.	
[26]	" "	"	.8113, 18°7.		
[27]	" "	"	.819, 18.°		
[28]	" "	"	.8142, 15.°		
[29]	" "	"	.8296, 0.°		
[30]	" "	"	.8168, 20.°	137.°	
[31]	" "	"	.8065, 40.°	740. m. m.	
[32]	" "	"	.7835, 99°15.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Amyl alcohol. iso.	$C_5H_{12}O$.	.8249, 0.°	120.°	
[2]	" " "	"	.8260, 0.°	759 m. m.	
	[For amylene hydrate, see miscellaneous compounds of the Ethylene Series.]				
[3]	Hexyl alcohol.	$C_6H_{14}O$.	.833, 0.°	148°–154.°	
[4]	" "	"	.754, 100.°		
[5]	" "	"	.820, 17.°	150°–152.°	
[6]	" "	"	.813, 0.°	151°–156.°	
[7]	" "	"	.819.	156°6.	
[8]	" " β.	"	.8327, 0.°		
[9]	" " "	"	.8209, 16.°	137.°	
[10]	" " "	"	.7482, 99.°	755.5 m. m.	
[11]	Heptyl "	$C_7H_{16}O$.	.792, 16°5.	178.°	
[12]	" "	"	.819, 23.°	177°–177°5.	
[13]	" "	"		178°5.	
[14]	" "	"		165.°	
[15]	" "	"		155°–160.°	
[16]	" " Products	"	.8291, 13°5.	163°–165.°	
[17]	" " from four	"	.8286, 19°5.	164°–167.°	
[18]	" " different	"	.795, 15.°	163°–168.°	
[19]	" " sources.	"	.8479, 16.°	164°5.	
[20]	Octyl "	$C_8H_{18}O$.	.823, 17.°	179.°	
[21]	" "	"		178.°	
[22]	" "	"		179.°	
[23]	" "	"	.826, 16.°	180°–184.°	
[24]	" "	"		181.°	
[25]	" "	"	.830. 16.°	190°–192.°	
[26]	" "	"		196°–197.°	
[27]	Decatyl alcohol.	$C_{10}H_{22}O$.	.8569, 0.°	203°3.	
[28]	Endecatyl " Secondary.	$C_{11}H_{24}O$.	.8268, 19.°	228°–229.°	
[29]	Cetyl "	$C_{16}H_{34}O$.			s. 48.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cetyl alcohol.	$C_{16} H_{34} O.$			s. 49°–49°5.
[2] Ceryl «	$C_{27} H_{56} O.$			79.°
[3] Myricyl «	$C_{30} H_{62} O.$			85.°

2d. OXIDES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[4] Methyl oxide.	$C_2 H_6 O.$		—21.°	
[5] « «	«		—23°65.	
[6] Methyl ethyl oxide.	$C_3 H_8 O.$		11.°	
[7] « « «	«		11.°	
[8] Ethyl oxide.	$C_4 H_{10} O.$	.7119, 24°8.	35°7.	
[9] « «	«	.713, 20.°	34.°	
[10] « «	«	.733, 12°5.		
[11] « «	«	.73568, 0.°	34°9.	
[12] « «	«	.72895, 6°9. m. of 2.		
[13] « «	«	.73574, 0.°	35°5.	
[14] « «	«		34°9.	
[15] « «	«		35°6.	
[16] « «	«	.728, 7.°	35.°	
[17] « «	«	.73644, 0.° m. of 2.		
[18] « «	«	.63987, 78°3.		
[19] « «	«	.60896, 99°9.		
[20] « «	«	.55958, 131°6.		
[21] « «	«	.51735, 157.°		
[22] « «	«	.7271, 10°2.		
[23] « «	«	.7204, 15°8.		
[24] Ethyl propyl oxide.	$C_5 H_{12} O.$	.7447, 0.°	54°–55.°	
[25] « butyl «	$C_6 H_{14} O.$	.7507, 0.°	78°–80.°	
[26] « « «	«	.761, 0.°	91°5–92°5.	
[27] « « «	«	.7694, 0.°		
[28] « « «	«	.7522, 20.°	91°7.	
[29] « « «	«	.7367, 40.°	742.7 m. m.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl amyl oxide.	$C_6 H_{14} O.$		92.°	
[2] Ethyl " "	$C_7 H_{16} O.$		112.°	
[3] " " "	"		111°–113.°	
[4] " " "	"	.8036, 14°7.		
[5] " " "	"	.764°, 18.°	112.°	
[Compare with amylene ethylate.]				
[6] Ethyl hexyl oxide.	$C_8 H_{18} O.$	.7752, 16°5.		
[7] " " "	"	.7638, 30.°	131°–133.°	
[8] " " "	"	.7344, 63.°		
[9] " " "	"	.776, 13.°	132°–134.°	
[10] Methyl heptyl "	"	830, 16°5.	160°5–161.°	
[11] Ethyl " "	$C_9 H_{20} O.$	.791, 16.°	177.°	
[12] Amyl "	$C_{10} H_{22} O.$	.779.	175°–183.°	
[13] " "	"	.7994, 0.°	170°–175.°	
[14] Amyl heptyl "	$C_{12} H_{26} O.$	.608, 20.°	220°–221.°	
[15] Hexyl " β.	"		203°5–208°5	
[16] Ethyl cetyl "	$C_{18} H_{38} O.$			20.°
[17] Amyl " "	$C_{21} H_{44} O.$			30.°
[18] Cetyl "	$C_{32} H_{66} O.$			55.°

3d. ACIDS OF THE FORMIC SERIES. $C_n H_{2n} O_2$.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[19] Formic acid.	$C H_2 O_2.$	1.2353, 12.°	98°5.	
[20] " "	"	1.2227, 0.°	105°3.	
[21] " "	"	1.2067, 13°7.	760 m. m.	
[22] " "	"		100.°	
[23] " "	"			1.°
[24] " "	"		101°1.	
[25] " "	"	1.2211, 20.°	99°8–100°3.	
[26] " "	"	1.2211,		
[27] " "	"	1.2165, 20.°		

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	Name.			Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Acetic	acid.		$C_2 H_4 O_2$.	1.0630, 16.°		22°5.
[2]	"	"		"			16.°
[3]	"	"		"		114.°	
[4]	"	"		"		120.°	
[5]	"	"		"	1.0622.	119.°	
[6]	"	"		"	1.0635, 15.°		
[7]	"	"	s.	"	1.100, 8°5.		
[8]	"	"	l.	"	1.0650, 13.°		
[9]	"	"		"		120.°	
[10]	"	"			1.08005, 0.°	117°3.	
[11]	"	"		"	1.06195, 17.°	760 m. m.	
[12]	"	"		"	1.0635, 10.°	116.°	17.°
[13]	"	"		"	1.0607, 15.°		
[14]	"	"		"	1.0563.		
[15]	"	"		"	1.0565. 15°5.		
[16]	"	"		"	1.0514, 20,°	118.°	
[17]	Propionic	acid.		$C_3 H_6 O_2$.		140.°.	
[18]	"	"		"		142.°	
[19]	"	"		"	1.0161, 0.°	141°6.	
[20]	"	"		"	.9911, 25°2.	760 m. m.	
[21]	"	"		"	.9963, 20.°	140.°	
[22]	"	"		"	.992, 18.°	139.°	
[23]	Butyric	"		$C_4 H_8 O_2$.	.9675, 25.°		
[24]	"	"		"	.963, 15.°	164.°	
[25]	"	"		"		164.°	
[26]	"	"		"	.98862, 0.°	157.°	
[27]	"	"		"	.9739, 15.° m. of 2.	760 m. m.	
[28]	"	"		"	.98165, 0.°	163.°	
[29]	"	"		"	.973, 7.°	156.°	
[30]	"	"		"	.9673, 15.°		
[31]	"	"		"	.9610, 20.°	162.°	
[32]	"	"		"	.9850, 13°5.	165.°	−12.°rs.−14.°

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Butyric acid. iso.	$C_4 H_8 O_2$.	.9598, 0.°	153°5 to 154°5.	
[2]	" " "	"	.9208, 50.°		
[3]	" " "	"	.8965, 100.°		
[4]	Valerianic acid.	$C_5 H_{10} O_2$.	.941, 14.°		
[5]	" "	"	.932, 28.°		
[6]	" "	"	.944, 10.°		
[7]	" "	"	.930, 12°5.		
[8]	" "	"	.937, 16°5.	175.°	
[9]	" "	"		175.	
[10]	" "	"	.9403, 15.°	175.°	
[11]	" "	"	.9555, 0.°	175°8.	
[12]	" "	"	.9378, 19°6.	760 m. m.	
[13]	" "	"	.935, 15.°	174°5.	
[14]	" "	"	.9558, 15.°		
[15]	" "	"	.9313, 20.°	174.°	
[16]	" "	"	.9577, 0.°		
[17]	" "	"	.9415, 20.°	185.°	
[18]	" "	"	.9284, 40.°	736 m. m.	
[19]	" "	"	.9034, 99°3.		
[20]	Caproic "	$C_6 H_{12} O_2$.	.922, 26.°		
[21]	" "	"	.931, 15.°	202°–209.°	
[22]	" "	"		198.°	
[23]	" "	"		198.°	
[24]	" "	"	.9252, 20.°	199.°	
[25]	" "	"	.925, 27.°	187°–198.°	
[26]	" "	"	.9449, 0.°	204°5 to 205.°	
[27]	" "	"	.9294, 20.°		
[28]	" "	"	.9172, 40.°		
[29]	" "	"	.8947, 99°1.	738.5 m. m.	
[30]	Oenanthylic acid.	$C_7 H_{14} O_2$.		212.°	
[31]	" "	"	.9167, 24.°	218.° (?)	
[32]	" "	"	.9179, 18.°	219.°	
[33]	" "	"	.9175, 20.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Caprylic acid.	$C_8 H_{16} O_2$.	.911, 20.°	236°–240.°	14°–15.°
[2] " "	"	.905, 21.°	238.°	5.° rs. 3.°
[3] " "	"	.901, 18.°		13.° rs. 9.°
[4] Pelargonic "	$C_9 H_{18} O_2$.		260.°	10.°
[5] " "	"	.903, 21.°	255.°	18.° rs. 13.°
[6] " "	"		248°–250.°	7.° s. 0.°
[7] Rutylic "	$C_{10} H_{20} O_2$.			30.°
[8] " "	"			27°2.
[9] " " l.	"	.930, 37.°	264.°	29°5. s. 28.°
[10] Lauric "	$C_{12} H_{24} O_2$.			42°–43.°
[11] " "	"			43.°
[12] " "	"	.883, 20.° s.		42°–43.°
[13] " "	"			43°8.
[14] " "	"			45.°
[15] " "	"			43°6.
[16] " "	"			43°5.
[17] Myristic "	$C_{14} H_{28} O_2$.			53°8.
[18] " "	"			53°8.
[19] " "	"			53.°
[20] Benomargaric acid.	$C_{15} H_{30} O_2$.			52°–53.°
[21] Isocetic "	"			55.°
[22] Cetic "	"			53°5.
[23] Palmitic "	$C_{16} H_{32} O_2$.			61.° s. 59.°
[24] " "	"			62.°
[25] " "	"			62.°
[26] Margaric "	$C_{17} H_{34} O_2$.			52°3. s. 50°5.
[27] " "	"			59°9.
[28] " "	"			60.°
[29] Stearic "	$C_{18} H_{36} O_2$.	1.01, 0.° s.		
[30] " "	"	.854. l.		
[31] " "	"			68. s. 65°8.
[32] " "	"			69°–69°2.
[33] " "	"			69°2.
[34] " "	"	a. 1.00, 9.°		70.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Stearic acid.	$C_{18} H_{36} O_2$.			69.°
[2] Arachidic acid.	$C_{20} H_{40} O_2$.			75.° s. 73°5.
[3] Benostearic acid.	$C_{22} H_{44} O_2$.			76.°
[4] Cerotic "	$C_{27} H_{54} O_2$.			78°–79.°
[5] " "	"			81°–82.°
[6] Melissic "	$C_{30} H_{60} O_2$.			88°–89.°

4th. ANHYDRIDES OF THE FORMIC SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[7] Acetic anhydride.	$C_4 H_6 O_3$.	1.073, 20°5.	137°5.	
[8] " "	"	1.0969, 0.°	138.°	
[9] " "	"	1.0799, 15°2.		
[10] " "	"	1.075, 15.°		
[11] " "	"		137.°	
[12] Propionic "	$C_6 H_{10} O_3$.		165.°	
[13] " "	"	1.01, 18.°	164°–166.°	
[14] Butyric "	$C_8 H_{14} O_3$.	.978, 12°5.	a. 190.°	
[15] Valeric "	$C_{10} H_{18} O_3$.		215.°	
[16] " "	"	.934, 15.°		
[17] Œnanthylic anhydride	$C_{14} H_{26} O_3$.	.91, 14.°		
[18] Caprylic "	$C_{16} H_{30} O_3$.		a. 280.°	
[19] Pelargonic "	$C_{18} H_{34} O$.			5.°
[20] Palmitic "	$C_{32} H_{64} O_3$.			53°8.

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5th. ETHERS OF THE SERIES C_n. H_{2n}. O_2.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl formate.	$C_2 H_4 O_2$.		36°–38.°	
[2] " "	"		32°9.	
[3] " "	"	.9984, 0.°		
[4] " "	"	.9776, 15°3.	33°4.	
[5] " "	"	.9766, 16.°	760 m. m.	
[6] Ethyl "	$C_3 H_6 O_2$.	.9157, 18.°		
[7] " "	"	.912.	53°4.	
[8] " "	"		54.°	
[9] " "	"		56.°	
[10] " "	"	.9394, 0.°		
[11] " "	"	.9188, 17.°		
[12] " "	"	.94474, 0.°	54°9.	
[13] " "	"	.92544, 15°7.	760 m. m.	
[14] " "	"		54°3.	
[15] " "	"	.9577, 0.°		
[16] " "	"	.93565, 0.°	52°9.	
[17] " "	"		53.°	
[18] " "	"	.917.	55°5.	
[19] Propyl "	$C_4 H_8 O_2$.	.9197, 0.°		
[20] " "	"	.877, 38°5.	82°5–83.°	
[21] " "	"	.836, 72°5.		
[22] " "	"	.9188, 0.°		
[23] " "	"	.8761, 38°5.	82°5–83.°	
[24] " "	"	.835, 72°5.		
[25] Butyl "	$C_5 H_{10} O_2$.		a. 100.°	
[26] " "	"	.8845, 0.°		
[27] " "	"	.850, 34.°	98°5.	
[28] " "	"	.8224, 59°8.		
[29] " "	"	.7962, 83°4.		
[30] Amyl "	$C_6 H_{12} O_2$.	.884, 15.°	114.°	

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[30] Delffs. 7. 26.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Amyl formate.	$C_6 H_{12} O_2$.	.8945, 0.°	112.°	
[2]	" "	"	.8743, 21.°		
[3]	" "	"	.8809, 15.°		
[4]	Methyl acetate.	$C_3 H_6 O_2$.	.919, 22.°	58.°	
[5]	" "	"		56°2.	
[6]	" "	"	.9328, 0.°		
[7]	" "	"	.9085, 21.°		
[8]	" "	"	.9562, 0.°	56°3.	
[9]	" "	"	.93735, 15°6.	760 m. m.	
[10]	" "	"		55.°	
[11]	" "	"	.86684, 0.°	59°5.	
[12]	Ethyl "	$C_4 H_8 O_2$.	.866, 7.°	71.°	
[13]	" "	"	.89, 15.°		
[14]	" "	"		74.°	
[15]	" "	"	.9051, 0.°		
[16]	" "	"	.91046, 0.° m. of 2.		
[17]	" "	"	.89277, 15°7.	74°3.	
[18]	" "	"	.8926, 15°9.	760 m. m.	
[19]	" "	"	.90691, 0.°	74°14.	
[20]	" "	"		74°6.	
[21]	" "	"	.906, 17°5.		
[22]	" "	"	.903, 17.°	77°5.	
[23]	" "	"	.932, 20.°	83.°	
[24]	" " Purest.	"	.9055, 17°5.	78°–78°5.	
[25]	" "	"	.8922, 15.°	74.°	
[26]	" "	"	.8981, 15.°		
[27]	" "	"	.903, 0.°	72°+.	
[28]	Propyl "	$C_5 H_{10} O_2$.		a. 90.°	
[29]	" "	"	.910, 0.°		
[30]	" "	"	.8635, 42°5.	103.°	
[31]	" "	"	.8137, 84°6.		

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[6] [7] Kopp. See 17.
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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propyl acetate.	$C_5H_{10}O_2$.	.910, 0.°	103.°	
[2]	" "	"	.8627, 42°.5.		
[3]	" "	"	.8128, 84°.6.		
[4]	" "	"	.913, 0.°	102.°	
[5]	Butyl acetate.	$C_6H_{12}O_2$.	.8845, 16.°	114.°	
[6]	" "	"		111°–113.°	
[7]	" "	"	.892, 0.°	111.°	
[8]	" "	"	.89096, 0.°	117°.5.	
[9]	" "	"	.8747, 16.°		
[10]	" "	"	.83143, 50.°		
[11]	" "	"	.9000, 0.°	125°.1.	
[12]	" "	"	.8817, 20.°	740 m. m.	
[13]	" "	"	.8659, 40.°		
[14]	" "	"	.9052, 0.°	116°.5.	
[15]	" "	"	.8668, 37°.1.	764 m. m.	
[16]	" "	"	.8328, 68°.9.		
[17]	" "	"	.8096, 89°.4.		
[18]	" "	"	.7972, 99°.75.		
[19]	Amyl "	$C_7H_{14}O_2$.		125.°	
[20]	" "	"	.8572, 21.°	133°.3.	
[21]	" "	"	.8765, 0.°		
[22]	" "	"	.8837, 0.°	137°.6.	
[23]	" "	"	.8692, 15°.1.		
[24]	" "	"	.863, 10.°	133.°	
[25]	" "	"	.8762, 15.°		
[26]	" "	"	.8733, 15.°	140.°	
[27]	" "	"	.8752, Two products.		
[28]	" "	"	.8963, 0.°	148°.4.	
[29]	" "	"	.8792, 20.°	737 m. m	
[30]	" "	"	.8645, 40.°		
[31]	" " iso.	"	.9222, 0.°	133°–135.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hexyl acetate.	$C_8 H_{16} O_2$.		145.°	
[2] " "	"	.8525, 0.°	140°–145.°	
[3] " " β.	"	.8778, 0.°	155°–157.°	
[4] " "	"	.8310, 50.°	787 m. m.	
[5] Heptyl "	$C_9 H_{18} O_2$.	.8868, 19.°		
[6] "	"	.8707, 16°5.	178°–180.°	
[7] " "	"	.8605, 16.°	180°–182.°	
[8] " "	"		180.°	
[9] Octyl "	$C_{10} H_{20} O_2$.		193.°	
[10] " "	"		191°–192.°	
[11] " "	"		190°–195.°	
[12] " "	"		200°–205.°	
[13] " "	"	.8717, 16.°	206°–208.°	
[14] Nonyl "	$C_{11} H_{22} O_2$.		208°–212.°	
[15] Cetyl "	$C_{18} H_{36} O_2$.	.858, 20.°	222°–225.°	18°5.
[16] Ethyl propionate.	$C_5 H_{10} O_2$.		101.°	
[17] " "	"	.9231, 0.°	93°2–98.°	
[18] " "	"	.8949, 26°3.		
[19] " "	"	.9137, 0.°		
[20] " "	"	.863, 45°1.	100.°	
[21] " "	"	.817, 83.°	760 m. m.	
[22] " "	"	.9139, 0.°		
[23] " "	"	.8625, 45°1.	100.°	
[24] " "	"	.816, 83.°		
[25] Propyl "	$C_6 H_{12} O_2$.	.903, 0.°		
[26] " "	"	.857, 51°27.	124°3.	
[27] " "	"	.795, 100°6.	760 m. m.	
[28] " "	"	.785, 108°34.		
[29] " "	"	.9022, 0.°		
[30] " "	"	.8498, 51°27.	123°5–125.°	
[31] " "	"	.7944, 100°6.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propyl propionate.	$C_6H_{12}O_2$.	.7839, 108°34.		
[2]	Butyl «	$C_7H_{14}O_2$.	.8934, 0.°		
[3]	« «	«	.8445, 49°2.	135°7.	
[4]	« «	«	.7903, 100°15.	764 m. m.	
[5]	« «	«	.7705, 116°5.		
[6]	« «	«	.8926, 0.°		
[7]	« «	«	.8437, 49°2.	135°7.	
[8]	« «	«	.7896, 100°15.		
[9]	« «	«	.7698, 116°5.		
[10]	Amyl «	$C_8H_{16}O_2$.		155.°	
[11]	Methyl butyrate.	$C_5H_{10}O_2$.		93.°	
[12]	« «	«	.92098, 0.°	95°9.	
[13]	« «	«	.9045, 15°5.°	760 m. m.	
[14]	« «	«	1.02928, 0.°	102°1.	
[15]	« «	«		93.°	
[16]	« «	«	.9091, 0.°		
[17]	« «	«	.8793, 30°3.		
[18]	Ethyl «	$C_6H_{12}O_2$.		110.°	
[19]	« «	«		110.°	
[20]	« «	«	.90412, 0.°	114°8.	
[21]	« «	«	.89065, 13.°	760 m. m.	
[22]	« «	«	.90193, 0.°	119.°	
[23]	« «	«		113.°	
[24]	« «	«	.8894, 15.°		
[25]	Propyl «	$C_7H_{14}O_2$.		a. 130.°	
[26]	« «	«	.888, 0.°		
[27]	« «	«	.841, 47°25.	137°25.	
[28]	« «	«	.785, 100°25.	765 m. m.	
[29]	« «	«	.753, 128°75.		
[30]	« «	«	.8872, 0.°		
[31]	« «	«	.8402, 47°24.	135°25.	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propyl butyrate.	$C_7 H_{14} O_2$.	.7842, 100°25.		
[2]	" "	"	.7525, 128°75.		
[3]	" " iso.	"	.8787, 0.°	128.°	
[4]	" " "	"	.8652, 13.°	755 m. m.	
[5]	Butyl "	$C_8 H_{16} O_2$.	.872, 0.°		
[6]	" "	"	.8245, 51°8.		
[7]	" "	"	.776, 99°6.	149°5.	
[8]	" "	"	.7445, 128°3.	758 m. m.	
[9]	" "	"	.8885, 0.°		
[10]	" "	"	.8717, 20.°	165°5.	
[11]	" "	"	.8579, 40.°	735.7 m. m.	
[12]	" "	"	.8719, 0.°		
[13]	" "	"	.8238, 50°8.	149°5.	
[14]	" "	"	.7753, 99°8.		
[15]	" "	"	.7439, 128°3.		
[16]	Amyl "	$C_9 H_{18} O_2$.	.8683, 15.°		
[17]	" "	"	.852, 15.°	176.°	
[18]	" "	"	.8769, 0.°		
[19]	" "	"	.8264, 55°4.	170°3.	
[20]	" "	"	.7839, 100°2.	760 m. m.	
[21]	" "	"	.7446, 139°5.		
[22]	Cetyl "	$C_{20} H_{40} O_2$.	.856, 20.° l.	260°–270.°	20.° rs. 15.°
[23]	Methyl valerate.	$C_6 H_{12} O_2$.	.8960, 0.°	114°–115.°	
[24]	" "	"	.8806, 16.°		
[25]	" "	"	.901525, 0.°		
[26]	" "	"	.88687, 15.°	116°2.	
[27]	" "	"	.88662, 15°3.	760 m. m.	
[28]	" "	"	.9005, 0.°		
[29]	" "	"	.8581, 41°5.	117°25.°	
[30]	" "	"	.8343, 64°3.		
[31]	" "	"	.7945, 100°1.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Ethyl valerate.	$C_7 H_{14} O_2$.	.894, 13.°	133°.5.	
[2]	" "	"	.869, 14.°	133°–134.°	
[3]	" "	"	.8829, 0.°	131.°	
[4]	" "	"	.8659, 18.°		
[5]	" "	"	.886, 0.°		
[6]	" "	"	.832, 55°.7.	135°.5.	
[7]	" "	"	.7843, 99°.63.	760 m. m.	
[8]	" "	"	.7582, 122°.5.		
[9]	Propyl "	$C_8 H_{16} O_2$.	.887, 0.°		
[10]	" "	"	.8395, 50°.8.	157.°	
[11]	" "	"	.7915, 100°.15.	761 m. m.	
[12]	" "	"	.776, 113°.7.		
[13]	" "	"	.8862, 0.°		
[14]	" "	"	.8387, 50°.8.	157.°	
[15]	" "	"	.7906, 100°.15.		
[16]	" "	"	.7755, 113°.7.		
[17]	" " iso.	"	.8702, 0.°	142.°	
[18]	" " "	"	.8538, 17.°	756 m. m.	
[19]	Butyl "	$C_9 H_{18} O_2$.	.8884, 0.°		
[20]	" "	"	.8438, 49°.7.	173°.4.	
[21]	" "	"	.7966, 100.°	760 m. m.	
[22]	" "	"	.7428, 155°.8.		
[23]	Amyl "	$C_{10} H_{20} O_2$.		a. 196.°	
[24]	" "	"	.8793, 0.°	188.°	
[25]	" "	"	.8645, 17°.7.		
[26]	" "	"	.8596, 15.°		
[27]	" "	"	.874, 0.°		
[28]	" "	"	.832, 50°.67.	190.°	
[29]	" "	"	.787, 100.°		
[30]	" "	"	.740, 149°.5.		
[31]	Octyl "	$C_{13} H_{26} O_2$.	.8624, 16.°	249°–251.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cetyl valerate.	$C_{21} H_{42} O_2$.	.852, 20.° l.	280°–290.° 202 m. m.	25.° rs. 20.°
[2] Methyl caproate.	$C_7 H_{14} O_2$.	.8977, 18.°	150.°	
[3] Ethyl "	$C_8 H_{16} O_2$.		120.°	
[4] " "	"	.882, 18.°	162.°	
[5] Amyl "	$C_{11} H_{22} O_2$.		211.°	
[The so-called œnanthic ether of Pelouze and Liebig, (see A. C. P. 19. 241.), is omitted on account of its uncertain character. See Delffs, pelargonic ether.]				
[6] Methyl caprylate.	$C_9 H_{18} O_2$.	.882.		
[7] Ethyl "	$C_{10} H_{20} O_2$.	.8738, 15.°	214.°	
[8] " "	"	.8728, 16.°	204°–206.°	
[9] Octyl "	$C_{16} H_{32} O_2$.	.8625, 16.°	297°–299.°	
[10] Ethyl pelargonate.	$C_{11} H_{22} O_2$.	.86.	216°–218.°	
[11] " " (?)	"	.8725, 15°5.	224.°	
[12] Methyl rutylate.	"		223°–224.°	
[13] Ethyl "	$C_{12} H_{24} O_2$.	.862.		
[14] " "	"		243°–245.°	
[15] Ethyl laurate.	$C_{14} H_{28} O_2$.	.86, 20.°	264.°	s.—10.°
[16] " "	"	.8671, 19.°	269.°	
[17] Ethyl myristate.	$C_{16} H_{32} O_2$.	.864. l.		
[18] Methyl palmitate.	$C_{17} H_{34} O_2$.			28.° s. 22.°
[19] Ethyl "	$C_{18} H_{36} O_2$.			24°2.
[20] " "	"			21°5. s. 18.°
[21] Amyl "	$C_{21} H_{42} O_2$.			13°5.
[22] " "	"			9.°
[23] Myricyl "	$C_{46} H_{92} O_2$.			71°5–72.°
[24] Methyl stearate.	$C_{19} H_{38} O_2$.			38.°
[25] Ethyl "	$C_{20} H_{40} O_2$.			27.°
[26] " "	"			30°–31.°
[27] " "	"			32.°
[28] " "	"			31.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethyl stearate.	$C_{20}H_{40}O_2$.			33°3.
[2] " "	"			33°7.
[3] " "	"			33°7.
[4] " "	"			32°9.
[5] Amyl "	$C_{23}H_{46}O_2$.			25°5.
[6] " "	"			25.° (?)
[7] Octyl "	$C_{26}H_{52}O_2$.			45.° (?)
[8] Cetyl "	$C_{34}H_{68}O_2$.			55°–60.°
[9] Methyl arachidate.	$C_{21}H_{42}O_2$.			54°–54°5.
[10] Ethyl "	$C_{22}H_{44}O_2$.			52°5. s. 51.°
[11] Amyl "	$C_{25}H_{50}O_2$.			44°8–45.°
[12] Ethyl benostearate.	$C_{24}H_{48}O_2$.			48°–49.°
[13] Ethyl cerotate.	$C_{29}H_{58}O_2$.			60°3.
[14] Ceryl "	$C_{54}H_{108}O_2$.			82.°

6th. ALDEHYDES OF THE SERIES $C_n H_{2n} O$.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[15] Acetic aldehyde.	$C_2 H_4 O$.	.7900, 18.°	21°8.	
[16] " "	"	.79442, 5°1.		
[17] " "	"	.79388, 5°6.	20°8.	
[18] " "	"	.80092, 0.°	760 m. m.	
[19] " "	"	.80551, 0.°	22.°	
[20] " "	"	.796, 15.°	23°–28.°	
[21] Isomer of aldehyde.	"	1.033, 0.°	110.°	
[22] Paraldehyde.	"		123°–124.°	12.°
[23] "	"	.998, 15.°	124.°	10°5. s. 10.°
[24] Elaldehyde.	"		94.°	2.° rs. 0.°
[25] Propionic aldehyde.	$C_3 H_6 O$.	.790, 15.°	55°–60.°	
[26] " "	"	.8284, 0.°	54°–63.°	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propionic aldehyde.	$C_3 H_6 O$.	.8327, 0.°	46.°	
[2]	" "	"	.8201, 9°7.		
[3]	" "	"	.7906, 32°6.		
[4]	" "	"	.804, 17.°	49°5.	
[5]	" "	"	.832, 0.°	46.°	
[6]	" "	"	.8192, 9°7.		
[7]	" "	"	.7898, 32°6.		
[8]	Butyric "	$C_4 H_8 O$.	.80, 15.°	68°–73.°	
[9]	" "	"	.8341, 0.°	73°–77.°	
[10]	" "	"	.8226, 0.°	62.°	
[11]	" "	"	.7919, 27°75.		
[12]	" "	"	.7638, 50°4.		
[13]	" "	"		a. 75.	
[14]	" "	"	.8618, 0.°	62.°	
[15]	" "	"	.7911, 27°75.		
[16]	" "	"	.763, 50°4.		
[17]	Valeric "	$C_5 H_{10} O$.	.818.		
[18]	" "	"	.820, 22.°	a. 110.°	
[19]	" "	"	.8009, 20.°	a. 90.°	
[20]	" "	"	.8224, 0.°	92°8.	
[21]	" "	"	.8057, 17°4.		
[22]	" "	"	.822, 0.°	92°5.	
[23]	" "	"	.779, 43°4.		
[24]	" "	"	.749, 71°9.		
[25]	" "	"	.8209, 0.°		
[26]	" "	"	.778, 43°4.		
[27]	" "	"	.7485, 71°9.		
[28]	Hexyl "	β. $C_6 H_{12} O$.	.8298, 0.°	127.°	
[29]	" "	"	.7846, 50.°	761.2 m. m.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Isomer of hexyl aldehyde.	$C_6 H_{12} O.$	.842. 15.°	180°–185.°	
[2] Œnanthol.	$C_7 H_{14} O.$	.8271, 7.°	155°–158.°	
[3] "	"		155°–156.°	
[4] "	"		155.°	
[5] "	"		151°–152.°	
[6] "	"	.827, 17.°	155°–156.°	
[7] Isomer of œnanthol.	"	.835, 14.°	161°–164.°	
[8] Octyl aldehyde.	$C_8 H_{16} O.$	.818, 19.°	171.°	
[9] " "	"	.820.	178.°	
[10] Euodyl " *	$C_{11} H_{22} O.$	.8497, 15.°	213.°	s. 7.°
[11] Lauryl "	$C_{22} H_{24} O.$		232.°	
[12] Cetyl "	$C_{16} H_{32} O.$			46°–47.°
[13] Palmityl "	"			52.°

7. ACETONES. GENERAL FORMULA $C_n H_{2n} O.$

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Acetone.	$C_3 H_6 O.$		56.°	
[15] "	"	.7921, 18.°	55°6.	
[16] "	"	.8144, 0.°	56°3.	
[17] "	"	.79945, 13°5.	760 m. m.	
[18] "	"		55°–56.°	
[19] "	"	.790, 15.°	56°–57.°	
[20] Methyl acetone.	$C_4 H_8 O.$	.838, 19.°	75°–77.°	
[21] " "	"	.8125, 13.°	81.°	
[22] " "	"	.824, 0.°	79°5–81.°	
[23] " "	"	.8063. 15°3.	77°–79.°	
[24] Acetyl ethyl.	"		77°5–78.°	
[25] Butyral.	"	.821, 22.°	95.°	
[26] Propione.	$C_5 H_{10} O.$		110.°	
[27] "	"		111.°	

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* Probably an acetone. Compare with methyl caprinal.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Propione.	$C_3 H_{10} O$.	.811, 11°5.	101.°	
[2] "	"	.8145, 0.°	101.°	
[3] "	"	.8015, 15.°]		
[4] "	"		100°–101.°	
[5] "	"	.8078, 18°5.	99°–101.°	
[6] Methyl butyral.	"	.827, 0.°	111.°	
[7] Ethyl acetone.	"	.842, 19.°	90°–95.°	
[8] " "	"	.8132, 13.°]	101.°	
[9] " "	"	.8040, 22.°]		
[10] Dimethyl acetone.	"	.8099, 13.°	93°5.	
[11] Ethyl butyral.	$C_6 H_{12} O$.	.833, 0.°	128.°	
[12] Isopropacetone.	"	.81892, 0.°	114.°	
[13] Methyl valeral.	"		120.°	
[14] Butyrone.	$C_7 H_{14} O$.	.830.	144.°	
[15] "	"		145.°	
[16] Diethyl acetone.	"	.8171, 22.°	137°5–139.°	
[17] Methyl amyl acetone.	"	.828—.829.	144.°	
[18] Methyl butyrone.	$C_8 H_{16} O$.	.827, 16.°	180.°	
[19] Methyl œnanthol.	"	.817, 23.°	171°–171°5.	
[20] Valerone.	$C_9 H_{18} O$.		164°–166.°	
[21] Caprone.	$C_{11} H_{22} O$.		165.°	
[22] Butyl butyrone.	"	.828, 20.°	222.°	s. 12.°
[23] Methyl caprinol.*	"	.8205, 17°5.]	224.°	s. 5° to 6.°
[24] " "	"	.8281, 18°5.]		
[25] " "	"	.8268, 20°5.	225°–226.°	15.° rs. 9.°
[26] Œnanthone.	$C_{13} H_{26} O$.	.825, 30.°	264.°	30.° rs. 29°5.
[27] Caprylone.	$C_{15} H_{30} O$.		278.°	40.° s. 38.°
[28] Caprinone.	$C_{19} H_{38} O$.			58.° s. 56.°
[29] Laurone.	$C_{23} H_{46} O$.			66.°
[30] Myristone.	$C_{27} H_{54} O$.			75.°
[31] Palmitone.	$C_{31} H_{62} O$.			84.° s. 80.°

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* Compare Methyl caprinol with Enodyl aldehyde.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Stearone.	$C_{35}H_{70}O$.			86.°
[2] "	"			87°8.

8th. OXIDES OF THE ETHYLENE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[3] Ethylene oxide.	C_2H_4O.	.8945, 0.°	13°5.	
[4] Propylene "	C_3H_6O.	.859, 0.°	35.°	
[5] Amylene "	$C_5H_{10}O$.	.824, 0.°	95.°	
[6] Octylene "	$C_8H_{16}O$.	.831, 15.°	145.°	
[7] Diamylene "	$C_{10}H_{20}O$.		170°–180.°	
[8] " "	"	.9402, 0.°	180°–190.°	
[9] Dioxethylene.	$C_4H_8O_2$.			
[10] Ethylene ethylidene oxide.	"	1.0482, 0.°	102.°	9.°
		1.0002, 0.°	82°5.	

9th. GLYCOLS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Ethylene glycol.	$C_2H_6O_2$.	1.125, 0.°	197°–197°5.	
[12] " "	"		193.°	
[13] Propylene "	$C_3H_8O_2$.	1.051, 0.°	188.°	
[14] " "	"	1.038, 23.°		
[15] Butylene "	$C_4H_{10}O_2$.	1.048, 0.°	183°–184.°	
[16] Amylene "	$C_5H_{12}O_2$.	.987, 0.°	177.°	
[17] Hexylene "	$C_6H_{14}O_2$.	.9669, 0.°	207.°	
[18] Octylene "	$C_8H_{18}O_2$.	.932, 0.°	235°–240.°	
[19] " "	"	.920, 29.°		

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10th. MISCELLANEOUS COMPOUNDS OF THE ETHYLENE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethylene diethylate.	$C_6 H_{14} O_2$.	.7993, 0.°	123°5.	
[2] Amylene ethylate.	$C_7 H_{16} O$.	.759, 21.°	102°–103.°	
[Compare the above with ethyl amyl oxide.]				
[3] Amylene hydrate.	$C_5 H_{12} O$.	.829, 0.	105°–108.°	
[4] Diamylene "	$C_{10} H_{22} O$.	.909, 0.°	163.°	
[5] Octylene "	$C_8 H_{18} O$.	.811, 0.°	174°–178.°	
[6] " "	"	.793, 23.°		
[Compare amylene and octylene hydrates with amyl and octyl alcohols.]				
[7] Diethylene alcohol.	$C_4 H_{10} O_3$.		245.°	
[8] " "	"	1.132, 0.°	a. 250.°	
[9] Triethylene "	$C_6 H_{14} O_4$.		285°–290.°	
[10] " "	"	1.138.	a. 290.°	
[11] Tetrethylene "	$C_8 H_{18} O_5$.		230° 25 m.m.	
[12] Pentethylene "	$C_{10} H_{22} O_6$.		281° 25 m.m.	
[13] Hexethylene "	$C_{12} H_{26} O_7$.		325° 25 m.m.	
[14] Ethylene monacetate.	$C_4 H_8 O_3$.		181°–182.°	
[15] " diacetate.	$C_6 H_{10} O_4$.	1.128, 0.°	186°–187.°	
[16] Diethylene "	$C_8 H_{14} O_5$.		245°–255.°	
[17] Triethylene "	$C_{10} H_{18} O_6$.		a. 300.°	
[18] Tetrethylene "	$C_{12} H_{22} O_7$.		320°+.	
[19] Ethylene monobutyrate	$C_6 H_{12} O_3$.		a. 220.°	
[20] " dibutyrate.	$C_{10} H_{18} O_4$.	1.024, 0.°	239°–241.°	
[21] " monovalerate.	$C_7 H_{14} O_3$.		a. 240.°	
[22] " divalerate.	$C_{12} H_{22} O_4$.		a. 255.°	
[23] " aceto-butyrate.	$C_8 H_{14} O_4$.		208°–215.°	
[24] " aceto-valerate.	$C_9 H_{16} O_4$.		a. 230.°	
[25] " distearate.	$C_{38} H_{74} O_4$.			76.°
[26] Propylene diacetate.	$C_7 H_{12} O_4$.	1.109, 0.°	186.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Butylene diacetate.	$C_8 H_{14} O_4$.		a. 200.°	
[2] Hexylene "	$C_{10} H_{18} O_4$.	1.014, 0.°	215°–220.°	
[3] Octylene "	$C_{12} H_{22} O_4$.		240°–245.°	
[4] " "	"		245°–250.°	
[5] Butylene acetate.	$C_6 H_{12} O_2$.		111°–113.°	
[6] Octylene acetate.	$C_{10} H_{20} O_2$.	.822, 0.°	163°–180.°	
[7] " "	"	.803, 26.°		
[Compare the two last with the acetates of butyl and octyl.]				

11th. ACIDS. LACTIC AND OXALIC SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Glycollic acid.	$C_2 H_4 O_3$.			78°–79.°
[9] Lactic "	$C_3 H_6 O_3$.	1.215, 10.°		
[10] Leucic "	$C_6 H_{12} O_3$.			73.°
[11] Oxalic acid. Sublimed.	$C_2 H_2 O_4$.	2.00, 9.°		
[12] " " Crystallized.	$C_2H_2O_4.2H^2O$	1.507.		
[13] " " "	"	1.622.		
[14] " " "	"	1629.		
[15] " " "	"	1.63, 9.°		
[16] " " "	"			a. 98.°
[17] Succinic acid.	$C_4 H_6 O_4$.	1.55.		
[18] " " Sublimed.	"	1. 529, 9.°		
[19] " " Crystallized.	"	1.552, 9.°		
[20] " "	"		235.° d.	180.°
[21] Pyrotartaric acid.	$C_5 H_8 O_4$.		190°+.	100.°+.
[22] " "	"			110°–112°5.
[23] " "	"			111°–112.°
[24] Adipic "	$C_6 H_{10} O_4$.			145.°
[25] Pimelic "	$C_7 H_{12} O_4$.			134.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pimelic acid.	$C_7 H_{12} O_4$.			114.°
[2] Suberic "	$C_8 H_{14} O_4$.			120.°
[3] " "	"			140.° rs. 138°5.
[4] Anchoic, Azelaic, or	$C_9 H_{16} O_4$.			114°–116.°
[5] Lepargylic acid.	"			115°–124.°
[6] " "	"			106.° rs. 104.°
[7] Sebacic "	$C_{10} H_{18} O_4$.	1.1317, melted.		127.°
[8] Roccellic "	$C_{17} H_{32} O_4$.			132.° s. 108.°

12th. CARBONATES, LACTATES, AND LEUCATES, OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[9] Ethyl carbonate.	$C_4 H_{10}$. $C O_3$.		125.°	
[10] " "	"		126.°	
[11] " "	"	.975, 19.°	125°–126.°	
[12] " "	"	.9998, 0.° }	123°5 to	
[13] " "	"	.9780, 20.° }	125°8.	
[14] Butyl "	$C_8 H_{18}$. $C O_3$.		190.°	
[15] Amyl "	$C_{10} H_{22}$. $C O_3$.	.9144.	224.°	
[16] " "	"	.9065, 15°5.	226.°	
[17] Ethyl ortho carbonate.	$C_9 H_{20} O_4$.	.925.	158°–159.°	
[18] " lactate.	$C_5 H_{10} O_3$.	1.0542, 0.° }	156.°	
[19] " "	"	1.042, 13.° }	753 m. m.	
[20] Diethyl "	$C_7 H_{14} O_3$.	.9203, 0.°	156°5	
[For dilactates and trilactates, see "miscellaneous ethers."]				
[21] Methyl leucate.	$C_7 H_{14} O_3$.	.9896, 16°5.	165.°	
[22] Ethyl "	$C_8 H_{16} O_3$.	.9613, 18°7.	175.°	
[23] Amyl "	$C_{11} H_{22} O_3$.	.93227, 13.°	225.°	

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13th. OXALATES, SUCCINATES, &c., OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl oxalate.	$C_4 H_6 O_4$.		161.°	51.°
[2] " "	"		163°5.	
[3] " "	"	1.1566, 50.°		
[4] Methyl-ethyl oxalate.	$C_5 H_8 O_4$.	1.27, 12.°	160°–170.°	
[5] Ethyl "	$C_6 H_{10} O_4$.	1.0929, 7°5.	183°–184.°	
[6] " "	"	1.086, 12.°	186.°	
[7] " "	"	1.1016, 0.°	186.°	
[8] " "	"	1.0815, 18°2.		
[9] " "	"	1.0824, 15.°		
[10] Amyl "	$C_{12} H_{22} O_4$.		262.°	
[11] " "	"		260.°	
[12] " "	"	.968, 11.°	265.°	
[13] Methyl succinate.	$C_6 H_{10} O_4$.	1.1179, 20.°	198.°	20.°s. 16.°
[14] Ethyl "	$C_8 H_{14} O_4$.	1.036.	214.°	
[15] " "	"		214.°	
[16] " "	"	1.0718, 0.°	217°3.	
[17] " "	"	1.0475, 25°5.		
[18] Isopropyl "	$C_{10} H_{18} O_4$.	1.009, 0.°	228.°	
[19] " "	"	.997, 18°5.	761 m. m.	
[20] Cetyl "	$C_{36} H_{70} O_4$.			58.°
[21] Ethyl pyrotartrate.	$C_9 H_{16} O_4$.		218.°	
[22] " adipate.	$C_{10} H_{18} O_4$.	1.001, 20°5.	230.°	
[23] " pimelate.	$C_{11} H_{20} O_4$.		185.°	
[24] Methyl suberate.	$C_{10} H_{18} O_4$.	1.014, 18.°	260.°	
[25] Ethyl "	$C_{12} H_{22} O_4$.	1.003, 18.°		
[26] " anchoate.	$C_{13} H_{24} O_4$.		325.°	
[27] Methyl sebate.	$C_{12} H_{22} O_4$.		285.°	25°5.
[28] Ethyl "	$C_{14} H_{26} O_4$.		308.°	

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14th. COMPOUNDS OF ALLYL AND DIALLYL.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Allyl alcohol.	$C_3 H_6 O$.		103.°	
[2] " "	"		92°–94.°	
[3] " "	"		93°–96.°	
[4] " "	"	.8581, 0.°	90°–92.°	s.—50.°
[5] " "	"	.8478, 27.°		
[6] " "	"	.8709, 0.°		
[7] " "	"	.81832, 62.°	96°–97.°	
[8] " "	"	.7846, 97.°		
[9] " "	"		92°–95.°	
[10] Diallyl monohydrate.	$C_6 H_{12} O$.	.8367, 0.°	93°–95.°	
[11] " dihydrate.	$C_6 H_{14} O_2$.	.9638, 0.°	212°–215.°	
[12] " "	"	.9202, 65.°		
[13] Pseudo diallyl alcohol.	$C_6 H_{12} O$.	.8604, 0.°	140.°	
[14] " " "	"	.8625,		
[15] Allyl oxide.	$C_6 H_{10} O$.		85°–87.°	
[16] " "	"		82.°	
[17] Ethyl allyl oxide.	$C_5 H_{10} O$.		a. 64.°	
[18] " " "	"		62°5.	
[19] Amyl allyl "	$C_8 H_{16} O$.		a. 120.°	
[20] Allyl formate.	$C_4 H_6 O_2$.	.9322, 17°5.	82°–83.°	
[21] " acetate.	$C_5 H_8 O_2$.		97°–100.°	
[22] " "	"		105.°	
[23] " butyrate.	$C_7 H_{12} O_2$.		a. 145.°	
[24] " "	"		a. 140.°	
[25] " valerate.	$C_8 H_{14} O_2$.		162.°	
[26] Diallyl monacetate.	$C_8 H_{14} O_2$.	.912.	150°–160.°	
[27] " diacetate.	$C_{10} H_{18} O_4$.	1.009, 0.°	225°–230.°	
[28] Ethyl allyl acetate.		.9222, 0.°	133°–135.°	
[29] Allyl oxalate.	$C_8 H_{10} O_4$.	1.055, 15°5.	206°–207.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Allyl benzoate.	$C_{10} H_{10} O_2$.		242.°	
[2] " "	"		230.°	
[3] " "	"		228.°	

15th. GLYCERINE, GLYCERIDES, AND ALLIED COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[4] Glycerine.	$C_3 H_8 O_3$.	1.27, 10.°		
[5] "		1.28, 15.°		
[6] "	"	1.260, 15°5.		
[7] "	"	1.115, 12°5.		
[8] "	"	1.2636, 15.°		
[9] "	"	1.26949, 6°7.	290.°	
[10] "	"	1.26244, 16°6.		
[11] Triethyl pyroglycerine	$C_{12} H_{26} O_5$.	1.00, 14.°	288°–290.°	
[12] Tetrethyl triglycerine.	$C_{17} H_{36} O_7$.	1.022, 14.°		
[13] Ethyl glycide.	$C_5 H_{10} O_2$.	a. 1.00.	128°–129.°	
[14] Amyl "	$C_8 H_{16} O_2$.	.90, 20.°	188.°	
[15] Aceto-glyceral.	$C_5 H_{10} O_3$.	1.081, 0.°	184°–188.°	
[16] Valero-glyceral.	$C_8 H_{16} O_3$.	1.027, 0.°	224°–228.°	
[17] Trimethyline.	$C_6 H_{14} O_3$.	.9483, 0.°	148.°	
[18] Monethyline.	$C_5 H_{12} O_3$.		225°–230.°	
[19] Diethyline.	$C_7 H_{16} O_3$.	.92.	a. 191.°	
[20] Triethyline.	$C_9 H_{20} O_3$.	.8955, 15.°	186.°	
[21] Ethyl amyline.	$C_{10} H_{22} O_3$.	.92.	238°–240.°	
[22] Monamyline.	$C_8 H_{18} O_3$.	.98, 20.°	260°–262.°	
[23] Diamyline.	$C_{13} H_{28} O_3$.	.907, 9.°	272°–274.°	
[24] Mono allyline.	$C_6 H_{12} O_3$.	1.1160, 0.°	a. 240.°	
[25] "	"	1.1013, 25.°		
[26] Monacetin.	$C_5 H_{10} O_4$.	1.20.		
[27] Diacetin. Acetidin.	$C_7 H_{12} O_5$.	1.184.	280.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Triacetin.	$C_9 H_{14} O_6$.	1.174.		
[2] Monobutyrin.	$C_7 H_{14} O_4$.	1.088.		
[3] Dibutyrin. Butyridin.	$C_{11} H_{20} O_5$.	1.081.		
[4] " "	"	1.084.		
[5] Tributyrin.	$C_{15} H_{26} O_6$.	1.056.		
[6] Monovalerin.	$C_8 H_{16} O_4$.	1.100.		
[7] Divalerin.	$C_{13} H_{24} O_5$.	1.059.		
[8] Laurostearin.	$C_{27} H_{52} O_5$.			44°–45.°
[9] Cocinin.	$C_{42} H_{80} O_6$.	.92, 8.° s.		
[10] Myristin.	$C_{45} H_{86} O_6$.			31.°
[11] Monopalmitin.	$C_{19} H_{38} O_4$.			58.° s. 45.°
[12] Dipalmitin.	$C_{35} H_{68} O_5$.			59.° s. 51.°
[13] Tripalmitin.	$C_{51} H_{98} O_6$.			60.° s. 46.°
[14] " 1st. modification	"			46.°
[15] " 2d. "	"			61°7. s. 45°5.
[16] " 3d. "	"			62°8.
[17] Monostearin.	$C_{21} H_{42} O_4$.			61.° s. 60.°
[18] Distearin. [tion.	$C_{39} H_{76} O_5$.			58.° s. 55.°
[19] Tristearin. 1st. modifica-	$C_{57} H_{110} O_6$.	.987, 10.°		60.°
[20] " " "	"	.9872, 15.°		65.°
[21] " " "	"	.9877, 15.°		65°5.
[22] " " "	"	.9867, 15.°		69°7.
[23] " " "	"	.9600, 51°5.		
[24] " 2d. "	"	1.0101, 15.°		69°7.
[25] " 3d. "	"	1.0178, 15.°		69°7.
[26] " " "	"	1.0179, 15.°		
[27] " " "	"	1.009, 51°5.		s. 50°5–51°7.
[28] " " "	"	.9931, 65°5.		
[29] " " "	"	.9746, 68°2.		
[30] " Liquid.	"	.9245, 65°5.		
[31] Diarachin.	$C_{43} H_{84} O_5$.			75.°
[32] Monolein.	$C_{21} H_{40} O_4$.	.947.		
[33] Diolein.	$C_{39} H_{72} O_5$.	.921, 21.°		s. 15.°

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16th. SACCHARINE, STARCHY, AND GUMMY BODIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cane sugar.	$C_{12} H_{22} O_{11}$.	1.600.		
[2] " "	"	1.606.		160.°
[3] " "	"	1.593.		
[4] " "	"	1.596.		
[5] " "	"	1.5578.		
[6] Milk "	"	1.534.		
[7] " "	"	1.53398, 4.°		
[8] Melezitose.	"			Below 140.°
[9] Mycose.	$C_{12}H_{22}O_{11}.2aq.$			100.°
[10] Glucose. Anhydrous.	$C_6 H_{12} O_6$.			146.°
[11] " Cryst.	$C_6H_{12}O_6.H_2O$.	1.3861.		
[12] " "	"	1.391.		
[13] " "	"	1.54–1.57, 11.°		
[14] Sorbite.	$C_6 H_{12} O_6$.	1.654, 15.°		
[15] Inosite.	$C_6 H_{12} O_6$. 2aq.			210°+.
[16] " Crystals.	"	1.1154, 5.°		
[17] Pinite.	$C_6 H_{12} O_5$.	1.520.		
[18] Quercite.	"			235.°
[19] Mannite.	$C_6 H_{14} O_6$.		a. 200.°	160°–165.°
[20] Dulcite.	"			a. 190.°
[21] "	"			182.° s. 181.°
[22] "	"			182.°
[23] "	"	1.466, 15.°		186.°
[24] "	"			187.°
[25] Erythromannite.	$C_4 H_{10} O_4$.	1.590.		112.°
[26] "	"			120.°
[27] Starch.	$C_6 H_{10} O_5$.	1.505.		
[28] "	"	1.530.		
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Starch. Arrowroot.	$C_6 H_{10} O_5$.	1.5045, air dried.		
[2] " Potato.	"	1.5029, " "		
[3] " "	"	1.6330, dried at 100.°		
[4] Cellulose.	"	1.525.		
[5] Gum.	$C_{12} H_{22} O_{11}$.	1.487, air dried.		
[6] "	"	1.525, dried at 100.°		
[7] " Gum arabic.	"	1.355.		
[8] " " tragacanth.	"	1.384.		
[9] " " Senegal.	"	1.436.		
[10] " Bassora gum.	"	1.359.		

17th. MISCELLANEOUS ACIDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Crotonic acid.	$C_4 H_6 O_2$.			72.° s. 70°5.
[12] Angelic "	$C_5 H_8 O_2$.		190.°	45.°
[13] Pyroterebic acid.	$C_6 H_{10} O_2$.	1.01.	200°+.	
[14] " "	"		210.°	
[15] Moringic "	$C_{15} H_{28} O_2$.	.908, 12°5.		
[16] Hypogæic "	$C_{16} H_{30} O_2$.			34°–35.°
[17] Oleic "	$C_{18} H_{34} O_2$.	.808, 19.°		
[18] " "	"			14.° s. 4.°
[19] Brassic "	$C_{22} H_{42} O_2$.			32°–33.°
[20] " "Erucic.	"			34.° s. 33.°
[21] Isopropacetic acid.	$C_5 H_{12} O_2$.	.95357, 0.°	175.°	
[22] Methyl diacetic "	$C_5 H_8 O_3$.	1.037, 9.°	169°–170.°	
[23] Ethyl " "	$C_6 H_{10} O_3$.	1.03, 5.°	180°8.	
[24] Methyl glycollic "	$C_3 H_6 O_3$.	1.180.	198.°	
[25] Amyl " "	$C_7 H_{14} O_3$.	1.003.	235.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Quartenylic acid.	$C_4 H_6 O_2$.	1.018,25.°	171°9.	
[2] Homolactic "	$C_2 H_4 O_3$.	1.197, 13.°		
[3] Linoleic "	$C_{16} H_{28} O_2$.	.9206, 14.°		
[4] Ricinoleic "	$C_{18} H_{34} O_3$.	.940, 15.°		s.-6°to-10.°
[5] Sorbic "	$C_6 H_8 O_2$.			134°5.
[6] Parasorbic "	"	1.068, 15.°	221.°	
[7] Hydrosorbic "	$C_6 H_{10} O_2$.	.969, 19.°	204°5.	
[8] Pyroracemic "	$C_3 H_4 O_3$.	1.288, 18.° l.	165.°	
[9] Citric "	$C_6 H_8 O_7$.	1.617.		
[10] " "	"	1.542.		
[11] " "	"	1.553.		
[12] Tartaric "	$C_4 H_6 O_6$.	1.75.		
[13] " "	"	1.764.		
[14] " "	"	1.739.		
[15] Racemic acid. Dextro.	$C_4H_6O_6.H_2O$	1.75.		
[16] " " Laevo.	"	1.7496.		
[17] " "	"	1.69.		
[18] Methyl salicylic acid.	$C_8 H_8 O_3$.	1.18, 10.°	222.°	
[19] Ethyl " "	$C_9 H_{10} O_3$.		225.°	
[20] " " "	"	1.097.	229°5.	
[21] " " "	"	1.1843, 10.°	221.°	
[22] Amyl " "	$C_{12} H_{16} O_3$.		270.°	
[23] Cinnamic "	$C_9 H_8 O_2$.	1.245.	300°-304.°	129.°
[24] " "	"	1.195.		
[25] Benzoic "	$C_7 H_6 O_2$.	1.29. Cryst.		
[26] " "	"	1.201, 21.° Solid.		
[27] " "	"	1.206, 25°8. } Liquid.		
[28] " "	"	1.227, 27.° }		
[29] " "	"	1.0838, 121°4.	249°2.	121°4.
[30] Alpha toluic "	$C_8 H_8 O_2$.	1.3. Solid.		
[31] " " "	"	1.0778, 83.° }		
[32] " " "	"	1.0334, 135.° }	265°5.	76°5.

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pimaric acid.	C_{20} H_{30} O_2.	1.047, 18.°		155.°
[2] Sylvic "	"	1.1011, 18.°		162.°
[3] Eugenic "	C_{10} H_{12} O_2.	1.076.	242.°	
[4] " "	"	1.0684, 14.°	251.°	
[5] Quinic "	C_7 H_{12} O_6.	1.637, 8°.5.		
[6] " "	"			161°.6.
[7] " "	"			161°–162°
[8] Ethyl camphoric acid.	C_{12} H_{20} O_4.	1.095, 20°.5.	196.°	
[9] Diethyl camphresic acid	C_9 H_{22} O_7.	1.128, 13.°		
[10] Phycic acid.		.896. Solid.	150.° d.	136.°
For salicylous acid, see "Salicylol."				
For carbolic acid, see "Phenol."				

18th. MISCELLANEOUS ETHERS OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Ethacetic ether.	C_6 H_{12} O_2.	.8942, 0.°	119.°	
[12] Diethacetic "	C_8 H_{16} O_2.	.8822, 0.°	151.°	
[13] Ethyl isopropacetate.	C_7 H_{14} O_2.	.8882, 0.°	134°–135.°	
[14] " "	"	.87166, 18.°	758.4 m. m.	
[15] Methyl methyldiacetate	C_6 H_{10} O_3.	1.020, 9.°	177°.4.	
[16] Ethyl "	C_7 H_{12} O_3.	.995, 14.°	189°.7.	
[17] Methyl ethyldiacetate.	"	1.009, 6.°	186°.8.	
[18] Ethyl "	C_8 H_{14} O_3.	.998, 12.°	198.°	
[19] " ethylglycollate.	C_6 H_{12} O_3.	.978.		
[20] " dimethoxalate.	"	.9931, 13.°		
[21] " ethomethoxalate.	C_7 H_{14} O_3.	.9768, 13.°	165°.5.	
[22] Methyl diethoxalate.	"	.9896, 16°.5.	165.°	
[23] Ethyl "	C_8 H_{16} O_3.	.9613, 18°.7.	175.°	
[24] " amylhydroxalate.	C_9 H_{18} O_3.	.9449, 13.°	203.°	
[25] " ethylamylhydroxalate.	C_{11} H_{22} O_3.	.9399, 13.°	224°–225.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Amyl diethoxalate.	$C_{11} H_{22} O_3$.	.93227, 13.°	225.°	
[2] Ethyl diamyloxalate.	$C_{14} H_{28} O_3$.	.9137, 13.°	262.°	
[3] " ethylcrotonate.	$C_8 H_{14} O_2$.	.9203, 13.°	165.°	
[4] " tiglate.	$C_7 H_{12} O_2$.	.926, 21.°	156.°	
[5] " quartenylate.	$C_6 H_{10} O_2$.	.927, 19.°	136.°	
[6] Acetoglycollic ether.	$C_6 H_{10} O_4$.	1.0093, 17.°	179.°	
[7] Acetyl lactic "	$C_7 H_{12} O_4$.	1.0458, 17.°	177.°	
[8] Lactobutyric "	$C_9 H_{16} O_4$.	1.024, 0.°	200°–210.°	
[9] " "	"	1.028, 0.°	208.°	
[10] Lactosuccinic ether.	$C_{11} H_{18} O_6$.	1.119, 0.°	280.°	
[11] Ethyl dilactate.	$C_8 H_{14} O_5$.	1.134, 0.°	235.°	
[12] Diethyl trilactate.	$C_{13} H_{22} O_7$.		a. 270.°	
[13] Diethyl glycollic ether.	$C_{20} H_{36} O_{10}$.	1.01, 19.°	251°–255.°	
[14] Diethyl glyoxylic "	$C_8 H_{16} O_4$.	.994, 18.°	199°2.	
[15] Benzoyl glycollic "	$C_{11} H_{12} O_4$.	1.1509, 20°4.	286°4–288°4	
[16] Methyl oleate.	$C_{19} H_{36} O_2$.	.879, 18.°		
[17] Ethyl "	$C_{20} H_{38} O_2$.	.871, 18.°		
[18] Methyl elaidate.	$C_{19} H_{36} O_2$.	.872, 18.°		
[19] Ethyl "	$C_{20} H_{38} O_2$.	.869, 18.°	370.°	
[20] " citrate.	$C_{12} H_{20} O_7$.	1.142, 21.°	283.°	
[21] " citraconate.	$C_9 H_{14} O_4$.	1.040, 18°5.	225.°	
[22] " mesaconate.	"	1.043, 20.°	220.°	
[23] " aconitate.	$C_{12} H_{18} O_6$.	1.074, 14.°	236.°	
[24] " fumarate.	$C_8 H_{12} O_4$.	1.106, 11.°	225.°	
[25] " veratrate.	$C_{11} H_{14} O_4$.	1.141, 18.° s.		42.°
[26] " pyromucate.	$C_7 H_8 O_2$.	1.297, 20.°	208°–210.°	34.°
[27] Methyl mucate.	$C_8 H_{16} O_8$.	1.43–1.50, 20.°		
[28] Ethyl "	$C_{10} H_{18} O_8$.	1.17,–1.32, 20.°		150°s135°
[29] " camphorate.	$C_{14} H_{24} O_4$.	1.029, 16.°	285°–287.°	
[30] " paracamphorate.	"	1.03, 15.°	270°–275.°	
[31] " camphresate.	$C_{16} H_{26} O_7$.	1.0775, 13.°		
[32] Methyl cinnamate.	$C_{10} H_{10} O_2$.	1.106.	241.°	
[33] Ethyl "	$C_{11} H_{12} O_2$.	1.126, 0.°	262.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethyl cinnamate.	$C_{11}H_{12}O_2$.		205.°	
[2] " "	"	1.13.	260.°	
[3] " "	"		262.°	
[4] " "	"	1.0656, 0.°	266.°	
[5] " "	"	1.0498, 20°2.	760 m. m.	
[6] Methyl benzoate.	$C_8H_8O_2$.	1.10, 17.°	198°5.	
[7] " "	"	1.1026, 0.°	199°2.	
[8] " "	"	1.0876, 16°3.		
[9] " "	"	1.0921, 12°3.		
[10] Ethyl "	$C_9H_{10}O_2$.	1.0539, 10°5.	209.°	
[11] " "	"	1.06, 18.°	208°–209.°	
[12] " "	"	1.049, 14.°	207.°	
[13] " "	"	1.0657, 0.°	212°9.	
[14] " "	"	1.0556, 10°5.		
[15] " "	"	1.0517, 14°1.		
[16] Amyl "	$C_{12}H_{16}O_2$.	1.0039, 0.°	260°7.	
[17] " "	"	.9925, 14°4.		
[18] " "	"		252°–254.°	
[19] Isopropyl "	$C_{10}H_{12}O_2$.	1.054, 0.°	218.°	
[20] " "	"	1.013, 25.°	762 m. m.	
[21] Ethyl toluate.	"		228.°	
[22] " xylylate.	$C_{11}H_{14}O_2$.		233.°	
[23] " cuminate.	$C_{12}H_{16}O_2$.		240.°	
[24] Methyl homotolhate.	$C_{10}H_{12}O_2$.	1.0455, 0.°	238°–239.°	
[25] " "	"	1.018, 49.°		
[26] Ethyl "	$C_{11}H_{14}O_2$.	1.0343, 0.°	247°–249.°	
[27] " "	"	.9925, 49.°		
[28] Amyl "	$C_{14}H_{20}O_2$.	9807, 0.°	291°–293.°	
[29] " "	"	.9520, 49.°		
[30] Diethyl oxybenzoate.	$C_{11}H_{14}O_3$.	1.0875, 0.°	263.°	
[31] " "	"	1.0725, 20.°		
[32] Methyl phenylacetate.	$C_9H_{10}O_2$. (?)	1.044, 16.°	220.°	
[33] Ethyl "	$C_{10}H_{12}O_2$. (?)	1.031.	226.°	

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19th. MISCELLANEOUS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dimethylene carbon-ethylene ether.	$C_8 H_{14} O_3$.	.998, 12.°	198.°	
[2] Aldehyde diacetate.		1.07, 10.°		
[3] Acrolein acetate.	$C_7 H_{10} O_4$.	1.076, 22.°	180.°	
[4] Methylal.	$C_3 H_8 O_2$.	.8551.	42.°	
[5] Dimethyl acetal.	$C_4 H_{10} O_2$.	.8555, 0.°	65.°	
[6] " "	"	.8674, 1.°	64°4.	
[7] " "	"	.8787, 0.°		
[8] " "	"	.8590, 14.°		
[9] " "	"	.8503, 22.°	63°–64.°	
[10] " "	"	.8497, 23.°		
[11] " "	"	.8476, 25.°		
[12] Methyl "	$C_5 H_{12} O_2$.	.8535, 0.°	85.°	
[13] Acetal.	$C_6 H_{14} O_2$.	.842, 21.°	75.°	
[14] "	"	.823, 20.°	95°2.	
[15] "	"	.821, 22°4.	104°–106.°	
[16] "	"		104.°	
[17] Dimethyl valeral.	$C_7 H_{16} O_2$.	.852, 10.°	124.°	
[18] Diethyl "	$C_9 H_{20} O_2$.	.835, 12.°	158°2.	
[19] Diamyl acetal.	$C_{12} H_{26} O_2$.	.8347, 15.°	210°8.	
[20] " valeral.	$C_{15} H_{32} O_2$.	.849, 7.°	240°–255.°	
[21] Valeral diacetate.	$C_9 H_{16} O_4$.	.963.	195.°	
[22] Derivative of valeral.	$C_{10} H_{18} O$.	.9027, 17.°	250°–290.°	
[23] Ethyl diacetone carbonate.	$C_{10} H_{18} O_3$.	.9738, 20.°	210°–212.°	
[24] " ethacetone "	$C_8 H_{14} O_3$.	.9834, 16.°	195.°	
[25] " dimethacetone "	"	.9913, 16.°	184.°	
[26] " isopropacetone "	$C_9 H_{16} O_3$.	.98046, 0.°	201.°	
[27] Acetyl valeryl.	$C_7 H_{12} O_2$.	.8804, 15°5.		
[28] Metacrolein.	$C_6 H_8 O_2$.	1.03, 8.°		
[29] Mesityl oxide.	$C_6 H_{10} O$.	.848, 23.°	131.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Acrolein.	$C_3 H_4 O$.		52°4.	
[2] Pinacone. l.	$C_6 H_{14} O_2$.	.96, 15.°	176°–177.°	
[3] Isobenzpinacone. l.	$C_{26} H_{22} O_2$.	1.10, 19.°	297°5.	
[4] Acropinacone.	$C_6 H_{10} O_2$.	.99, 17.°	160°–180.°	
[5] Pinacolin.	$C_6 H_{12} O$. (?)	.7999, 16.°	105.°	
[6] Phorone.	$C_9 H_{14} O$. (?)	.939, 12.°		
[7] «	«	.932, 12.°		
[8] « Camphorone.	«	.9614, 20.°		
[9] «	«		196.°	20.°
[10] Diacetyl conylene.	$C_{12} H_{20} O_4$.	.988, 18°2.	225.°	
[11] Derivative of chloroform	$C_7 H_{16} O_3$.	.8964,	145°–146.°	
[12] Triethyl propylphycite.	$C_9 H_{20} O_4$.	.976, 0.°		
[13] « « «	«	.96051, 16°5.		
[14] Diethoxyl ether.	$C_8 H_{18} O_3$.	.8924, 21.°	168.°	
[15] Citraconic anhydride.	$C_5 H_4 O_3$.	1.247.		
[16] Camphoric « s.	$C_{10} H_{14} O_3$.	1.194, 20°5.	270.°	217.°
[17] Camphor.	$C_{10} H_{16} O$.	.986,–.996.		
[18] Patchouli camphor.	$C_{30} H_{28} O_2$.	1.051, 4°5.	296.°	54°–55.°
[19] Ethylated camphor.	$C_{12} H_{20} O$.	.946, 22.°	226°–231.°	
[20] Amylated «	$C_{16} H_{26} O$.	.919, 15.°	272°–275.°	
[21] Acetyl «	$C_{12} H_{18} O_2$.	.986, 20.°	227°–230.°	
[22] Ethylated borneol.	$C_{12} H_{22} O$.	.916, 23.°	202°5.	
[23] Methylated «	$C_{11} H_{20} O$.	.933, 15.°	194°5.	
[24] Camphrene.	$C_8 H_{12} O$.	.974, 6.°	a. 240.°	
[25] Acetyl camphrene.	$C_{20} H_{30} O_2$.	.954, 18.°	230°–240.°	
[26] Styryl alcohol.	$C_9 H_{10} O$.		254.°	8.°
[27] Anisaldehyde.	$C_8 H_8 O_2$.	1.09, 20.°	253°–255.°	
[28] «	«	1.1228, 18.°	247°–248.°	
[29] Salicylol, salicylous acid,	$C_7 H_6 O_2$.	1.1731, 13°3.	196°5.	
[30] or salicyl hydride.	«		182°–185.°	
[31] « «	«		178°2.	
[32] Salicin. Natural.	$C_{13} H_{18} O_7$.	1.4338, 26.°		
[33] « Artificial.	«	1.4257.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Saliretin.	$C_7 H_6 O$.	1.1161, 25.°		
[2] Saligenin.	$C_7 H_8 O_2$.	1.1613, 25.°		
[3] Benzoyl hydride.	$C_7 H_6 O$.	1.075.		
[4] " "	"	1.038, 15.°	180°–183.°	
[5] " "	"	1.043.		
[6] " "	"	1.0636, 0.°	179.°	
[7] " "	"	1.0499, 14°6.		
[8] " "	"	1.0504.		
[9] Methyl benzoyl.	$C_8 H_8 O$.	1.032, 15.°	198.°	
[10] Benzoycin.	$C_{10} H_{12} O_4$.	1.228.		
[11] Isomer of benzil.	$C_{14} H_{10} O_2$.	1.104, 10.°	314.°	
[12] Ethyl benzhydrol ether.	$C_{15} H_{16} O$.	1.029, 20.°	183.°	
[13] Acetic " "	$C_{15} H_{14} O_2$.	1.49, 22.°	301°–302.°	
[14] Benzyl benzoate.	$C_{14} H_{12} O_2$.		345.°	
[15] " "	"	1.114, 18°5.	303°–304.°	
[16] " cinnamate.	$C_{15} H_{15} O_2$.		305.°	
[17] " " [dride.	"	1.098, 14.°		
[18] Benzo œnanthylic anhy-	$C_{14} H_{18} O_3$.	1.043.		
[19] Benzo cinnamic "	$C_{16} H_{12} O_3$.	1.184, 23.°		
[20] Benzo cuminic "	$C_{17} H_{16} O_3$.	1.115, 23.°		
[21] Cuminol.	$C_{10} H_{12} O$.		220.°	
[22] "	"	.9832, 0.°	236.°	
[23] "	"	.9727, 13°4.		
[24] "	"	.9751, 15.°		
[25] Veratrol. l.	$C_8 H_{10} O_2$.	1.086, 15.°	202°–205.°	15.°
[26] Phenyl acetate.	$C_8 H_8 O_2$.		188.°	
[27] " "	"	1.074.	200.°	
[28] Benzyl "	$C_9 H_{10} O_2$.		210.°	
[29] Ethyl phenyl carbonate.	$C_9 H_{10} O_3$.	1.117, 0.°	234.°	
[30] Phenol.	$C_6 H_6 O$.	1.062, 20.°	197°5.	
[31] "	"	1.065, 18.°	187°–188.°	34°–35.°
[32] "	"	1.0627.	184.°	
[33] "	"	1.0808, 0.°	187°6–188°1.	
[34] "	"	1.0597, 32°9.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Phenol.	$C_6 H_6 O.$	1.0554.	187.°	s.—18.°
[2] «	«	1.068.	186°–187.°	
[3] «	«	1.0667, 38.°	183.°	37°5.
[4] Kresol.	$C_7 H_8 O.$	1.033, 23.°	198.°	
[5] «	«		198.°	35.°
[6] Metakresol.	«		189°–190.°	s.—38.°
[7] Parakresol.	«		197.°	36.° s. 34.°
[8] «	«		201°5–202.°	34°5.
[9] Benzyl alcohol.	$C_7 H_8 O.$	1.059.	204.°	
[10] « «	«	1.0628, 0.°	206°5.	
[11] « «	«	1.0507, 15°4.	751.4 m. m.	
[12] « «	«	1.0465, 19.°	206°2.	
[13] Anisol.	$C_7 H_8 O.$	.991, 15.°	152.°	
[14] Phenetol.	$C_8 H_{10} O.$		175.°	
[15] «	«	Less than water.	172.°	
[16] Ethyl phenol.	$C_8 H_{10} O.$		211.°	47°–48.°
[17] Xylenol. Phloretol.	$C_8 H_{10} O.$	1.0374, 12.°	a. 220.°	
[18] « Alpha.	«	.9709, 81.°	213°5.	75.°
[19] « Beta.	«	1.036, 0.°	211°5.	
[20] « «	«	.9700, 81.°		
[21] « Xenol.	«	1.0233, 22.°	214°2.	
[22] Ethyl kresol.	$C_9 H_{12} O.$	.8744, 0.°	188.°	
[23] Isopropyl phenate.	$C_9 H_{12} O.$	.958, 0.°	176.°	
[24] « «	«	.947, 12°5.		
[25] Styrolyl ethyl ether.	$C_{10} H_{14} O.$	.931, 21°9.	185°–187.°	
[26] Thymol, of Ajowan oil.	$C_{10} H_{14} O.$	1.0285. s.	distils 222.°	44.°
[27] « Cymyl alcohol.	«		243.°	
[28] Isobutyl anisol.	$C_{10} H_{14} O.$	.9388, 16.°	198.°	
[29] Phenamylol.	$C_{11} H_{16} O.$		224°–225.°	
[30] Methyl thymol.	$C_{11} H_{16} O.$	.941, 18.°	205.°	
[31] Carvol.	$C_{10} H_{14} O.$	.953, 15.°	225°–230.°	
[32] Geraniol.	$C_{10} H_{18} O.$	8851, 15.°	232°–233.°	
[33] «	«	8813, 21.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cajeputene hydrate.	$C_{10}H_{18}O$.	.903, 17.°	175.°	
[2] Cinacrol.	$C_{10}H_{18}O_2$.	1.05–1.15.	a. 250.°	
[3] Colophonone.	$C_{11}H_{18}O$.	.84.	97.°	
[4] Ericinol.	$C_{10}H_{16}O$.	.874, 20.°	240°–242.°	
[5] Oil Mentha Pulegium.	$C_{10}H_{16}O$.	.9271,—.939.	182°–185.°	
[6] Geraniol ether.	$C_{20}H_{34}O$.		187°–190.°	
[7] Cardol.	$C_{21}H_{31}O_2$.	.978, 23.°		
[8] Ivaol.	$C_{26}H_{40}O$.	.9346, 15.°		
[9] Terpinol.	$C_{20}H_{34}O_2$.	.852.	168.°	
[10] Eucalyptol.	$C_{12}H_{20}O$.	.905, 8.°	175.°	
[11] Safrol.	$C_{10}H_{10}O_2$.	1.1141, 0.°	231°–233.°	
[12] Kreosol.	$C_8H_{10}O_2$.	1.0894, 13.°	219.°	
[13] Cholesterine.	$C_{26}H_{44}O$.	1.03, Melted.		169°–170.°
[14] Santonin.	$C_{15}H_{18}O_3$.	1.247, 20°5.		135°–136.°
[15] Cochlearin.	$C_6H_{14}O_2$.(?)	1.248.		45.°
[16] Picrolichenin.		1.176.		
[17] Calophyllum Resin.	$C_{14}H_{18}O_4$.	1.12, Cryst.		105.° s. 90.°
[18] Antiar Resin.	$C_{16}H_{24}O$.	1.032.		
[19] Guyaquillite.	$C_{20}H_{26}O_3$.	1.092.		
[20] Hartin.	$C_{20}H_{34}O_2$.	1.115, 19.°		210.°
[21] From wormseed oil.	$C_{12}H_{20}O$.	.919, 20.°	174°–175.°	
[22] " Angostura bark.	$C_{13}H_{24}O$.	.934.	a. 266.°	
[23] Oil of wormwood.	$C_{10}H_{16}O$.	.973, 24.°	200°–205.°	
[24] From oil of Osmitopsis asteriscoides.	$C_{10}H_{18}O$.	.921.	178°–188.°	
[25] Oil of Coriander.	$C_{10}H_{18}O$.	.871, 14.°	150.°	
[26] " " Ginger.	$C_{80}H_{138}O_5$.	.893.	246.°	
[27] " " Pulegium micranthum.	$C_{10}H_{16}O$.	.932, 17.°	227.°	
[28] Alöisol.	$C_6H_{16}O_3$.(?)	.877, 15.°	130.°	
[29] Xanthil.	$C_4H_{20}O_3$.(?)	.894.	130.°	
[30] Furfurol.	$C_5H_4O_2$.		162.°	
[31] "	"	1.1648, 15°6.	162°8–163°3	
[32] "	"	1.1636, 13°5.	166.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Furfurol.	$C_5 H_4 O_2$.	1.168, 15°5.	161°6.	
[2] "	"	1.134, } 15.°	160°–180.°	
[3] "	"	1.150, }		
[4] Fucusol.	$C_5 H_{10} O_2$.	1.150, 13°5.	171°–172.°	
[5] Guajol.	$C_9 H_{14} O_2$.	.871, 15.°	115°–120.°	
[6] Guajacol.		1.1171, 13.°	210.°	
[7] "		1.119, 22.°	210.°	
[8] "		1.125, 16.°	203°–205.°	
[9] "		1.119, 17°5.		
[10] Kapnomor.		.9775, 20.°	185.°	
[11] "		.995, 15°5.		
[12] Kreosote.		1.037, 20.°	203.°	
[13] "		1.076, 15°5.		
[14] "		1.04, 11°5.		
[15] "		1.057, 13.°	202°–210.°	
[16] "		1.0831, 17°5.		
[17] "		1.0874, 20.°	195.°	
[18] "		1.087, 16.°		
[19] Mesitene.	$C_6 H_{24} O_3$.(?)	.808.	63.°	
[20] Xylite.		.816.	61°5.	
[21] "		.805.	61°–62.°	

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XLI. Compounds Containing C, H, and N.

1st. CYANIDES OF THE ETHYL SERIES.*

Nitriles.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl cyanide.	$C H_3$. Cy.		77.°	
[2] " "	"	.8347, 0.°	70°9–72°1.	
[3] " "	"	.8191, 16.°		
[4] " "	"		77°–78.°	
[5] " "	"		77°6.	
[6] " "	"		77°–78.°	
[7] " "	"		81°–82.°	
[8] Ethyl "	$C_2 H_5$. Cy.	.787, 15.°	82.°	
[9] " "	"	.7889, 12°6.	88.°	
[10] " "	"		97°–98.°	
[11] " "	"		96°7.	
[12] " "	"		98.°	
[13] Propyl "	$C_3 H_7$. Cy.	.795, 12°5.	118°5.	
[14] " " iso.	"		a. 80.°	
[15] Butyl "	$C_4 H_9$. Cy.	.810.	125.°	
[16] " "	"	.813, 15.°	125°–128.°	
[17] " "	"	.8164, 0.°	140°4.	
[18] Amyl "	$C_5 H_{11}$. Cy.	.8061, 20.°	146.°	
[19] Heptyl "	$C_7 H_{15}$. Cy.	.8201, 13°3.	194°–195.°	
[20] Octyl "	$C_8 H_{17}$. Cy.	.8187, 14.°	200.°	

2d. AMINES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[21] Dimethylamine.	$C_2 H_7 N$.		–10°, to–15.°	
[22] " "	"		8°–9.°	
[23] Ethylamine.	$C_2 H_7 N$.	.6964, 8.°	18°7.	

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* Compare these cyanides with the carbylamines.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Trimethylamine.	$C_3 H_9 N$.		9.°	
[2] Propylamine.	"		49°.7.	
[3] "	"	.7283, 0.°	49°–50.°	
[4] "	"	.7134, 21.°	761 m. m.	
[5] " iso.	"	.690, 18.°	31°.5.	
[6] " iso.	"		31°–32°.5.	
[7] Diethylamine.	$C_4 H_{11} N$.		57.°	
[8] Butylamine.	$C_4 H_{11} N$.		69°–70.°	
[9] "	"	.7553, 0.°	75°.5.	
[10] "	"	.7333, 26.°	740 m. m.	
[11] Amylamine.	$C_5 H_{13} N$.		93.°	
[12] "	"	.7503, 18.°	95.°	
[13] "	"	.815, 0.°	95.°	
[14] " iso.	"	.755, 0.°	78°.5.	
[15] Di-isopropylamine.	$C_6 H_{15} N$.	.722, 22.°	83°.5–84.°	
[16] Hexylamine.	$C_6 H_{15} N$.	.768, 17.°	125°–128.°	
[17] Heptylamine.	$C_7 H_{17} N$.		144°–148.°	
[18] "	"		145°–147.°	
[19] Methylethylamylamine.	$C_8 H_{19} N$.		135.°	
[20] Octylamine.	$C_8 H_{19} N$.	.786.	164.°	
[21] "	"		172°–175.°	
[22] "	"		175.°	
[23] "	"		168°–172.°	
[24] Diethylamylamine.	$C_9 H_{21} N$.		154.°	
[25] Nonylamine.	$C_9 H_{21} N$.		190°–192.°	
[26] Diamylamine.	$C_{10} H_{23} N$.		170.°	
[27] "	"	.7825, 0.°	178°–180.°	
[28] Triamylamine.	$C_{15} H_{33} N$.		257.°	
[29] Tricetylamine.	$C_{48} H_{99} N$.			39.° s. 33.°

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3d. BASES OF THE ANILINE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Phenylamine. Aniline.	$C_6 H_7 N$.	1. 020, 16.°	182.°	
[2] " "	"	1.028.	228.°	
[3] " "	"	1.0361, 0.°	184°8.	
[4] " "	"	1.0251, 13°7.		
[5] " "	"	1.018, 15°5.	184°5.	
[6] Toluidine. Benzylamine.	$C_7 H_9 N$.		198.°	
[7] "	"	.990, 14.°	183.°	
[8] "	"		205°–206.°	45.°
[9] " Pseudo.	"	1.0002, 16°3.	198.°	
[10] "	"	1.003, 20°2.	199.°	
[11] " Different	"	.998, 25°5.	199.°	
[12] " preparations.	"		200.°	45.°
[13] "	"	1.002, 22.°	199.°	
[14] Methyl aniline.	$C_7 H_9 N$.		192.°	
[15] Xylidine.	$C_8 H_{11} N$.	.985, 18°5.	216.°	
[16] " Alpha.	"	.975, 22.°	213°–214.°	
[17] " Beta.	"	.983, 22.°	210°–211.°	
[18] Ethyl aniline.	$C_8 H_{11} N$.	.954, 18.°	204.°	
[19] Cumidine.	$C_9 H_{13} N$.	.8526.	225.°	
[20] Ethyl toluidine.	$C_9 H_{13} N$.	.9391, 15°5.	217.°	
[21] Cymidine.	$C_{10} H_{15} N$.	Less than water.	a. 250.°	
[22] Diethyl aniline.	$C_{10} H_{15} N$.	.939, 18.°	213°5.	
[23] Amyl "	$C_{11} H_{17} N$.		258.°	
[24] Diethyl toluidine.	$C_{11} H_{17} N$.	.9242, 15°5.	229.°	
[25] Ethyl amyl aniline.	$C_{13} H_{21} N$.		262.°	
[26] Diamyl "	$C_{16} H_{27} N$.		275°–280.°	
[27] Cetyl "	$C_{22} H_{39} N$.			42.° s. 28.
[28] Dibenzylamine.	$C_{14} H_{15} N$.	1.033, 14.°		
[29] Allyl aniline.	$C_9 H_{11} N$.	.982, 25.°	208°–209.°	

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44h. BASES OF THE PYRIDINE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pyridine.	C_5H_5N	.985, 0.°	116°.	
[2] "		.924, 22.°	115.°	
[3] "			116°5.	
[4] Picoline	C_6H_7N	.955, 16.°	133.°	
[5] "	"	.913, 0.°	135.°	
[6] "	"	.933, 22.°	134.°	
[7] "	"		135.°	
[8] "	"		135.°	
[9] Parapicoline	"	.957.	260°–315.°	
[10] Lutidine.	C_7H_9N.	.928.	177°–183.°	
[11] "		.9467, 0.°	154°5.	
[12] "	"	.945, 22.°	154.°	
[13] " Alpha.	"	.9467, 0.°	154.°	
[14] " Beta.	"	.9555, 0.°	167°–168.°	
[15] Collidine	$C_8H_{11}N$.	.921.	170.°	
[16] "	"		170.°	
[17] "		.9420, 0.°	180.°	
[18] "	"		180.°	
[19] "	"	.953, 22.°	170.°	
[20] "	"		170°–180.	
[21] Parvoline	$C_9H_{13}N$	.966, 22.°	188.°	
[22] Viridine	$C_9H_{13}N$	.974, 22.°	211.°	
[23] Rubidine	$C_{10}H_{15}N$	.917, 22.°	230.°	
[24] Viridine	$C_{10}H_{15}N$	.924, 22.°	251.°	

44i. MISCELLANEOUS COMPOUNDS.

Name	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl carbylamine	C_2H_3N.		58°–59.°	
[2] Ethyl "	C_3H_5N		78°–80.°	
[3] Isopropyl "	C_4H_7N.	.796 [4]	94° [5]	
[6] Butyl "	C_5H_9N	.78–.79 [7]	110°–120° [8]	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Acetylamine. (?)	$C_2 H_5 N.$	.975, 15.°	218.°	
[2] Allylamine.	$C_3 H_7 N.$	.864, 15.°	58.°	
[3] Ethylene cyanide.	$C_4 H_4 N_2.$	1.023, 45.°	37.°	
[4] Allyl "	$C_6 H_5 N.$	.8389, 12.°	118°7–119°2.	
[5] " "	"	.812, 0.°	96°–106.°	
[6] " "	"	.794, 17.°		
[7] " "	"	.8491, 0.°	116°–118.°	
[8] " "	"	.8351, 15.°		
[9] Phenyl "	$C_7 H_5 N.$	1.0073, 15.°	190°–191.°	
[10] " "	"	1.0230, 0.°	190°6.	
[11] " "	"	1.0084, 16°8.		
[12] Cumonitrile.	$C_{10} H_{11} N.$	.765, 14.°	239.°	
[13] Chinoline.	$C_9 H_7 N.$	1.081, 10.°	239.°	
[14] "	"		238°–243.°	
[15] Lepidine.	$C_{10} H_9 N.$	1.072, 15.°	266°–271.°	
[16] Pyrrol.	$C_4 H_5 N.$	1.077.	133.°	
[17] Coniine.	$C_8 H_{15} N.$	.89.	187°5.	
[18] "	"		189.°	
[19] "	"		212.°	
[20] "	"	.878.	168°–171.°	
[21] "	"		163°5.	
[22] Nicotine.	$C_5 H_7 N.$	1.033, 4.°		
[23] "	"	1.027, 15.°		
[24] "	"	1.018, 30.°		
[25] "	"	1.0006, 50.°		
[26] "	"	.9424, 101°5.		

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XLII. Compounds Containing C, H, N, and O.

1st. NITRITES AND NITRATES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl nitrite.	$C H_3 N O_2$.	.991.	—12.°	
[2] Ethyl "	$C_2 H_5 N O_2$.	.886, 4.°		
[3] " "	"	.947, 15.°	16°.4.	
[4] " "	"	.898.	17°.5–18.°	
[5] " "	"	.900, 15°.5.	16°.6–17°.8.	
[6] Isopropyl "	$C_3 H_7 N O_2$.	.856, 0.°	45.°	
[7] " "	"	.844, 24.°	762 m. m.	
[8] Butyl "	$C_4 H_9 N O_2$.	.89445, 0.°		
[9] " "	"	.8771, 16.°	67.°	
[10] " "	"	.82568, 50.°		
[11] Amyl "	$C_5 H_{11} N O_2$.		96.°	
[12] " "	"	.8773.	91.°	
[13] " "	"		99.°	
[14] Methyl nitrate.	$C H_3 N O_3$.	1.182, 20.°	66.°	
[15] Ethyl "	$C_2 H_5 N O_3$.	1.112, 17.°	85.°	
[16] " "	"	1.1322, 0.°	86°.3.	
[17] " "	"	1.1123, 15°.5.		
[18] " "	"	1.0948, 17.°	87°.2.	
[19] Isopropyl "	$C_3 H_7 N O_3$.	1.054, 0.°	101°–102.°	
[20] " "	"	1.036, 19.°	760 m. m.	
[21] Butyl "	$C_4 H_9 N O_3$.		a. 130.°	
[22] " "	"	1.0384, 0.°	123.°	
[23] " "	"	1.020, 16.°		
[24] Amyl "	$C_5 H_{11} N O_3$.	.902, 22.°	137.°	
[25] " "	"	.994, 10.°	148.°	
[26] " "	"	1.000, 7°–8.°	147°–148.°	

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2d. NITRO-SUBSTITUTION COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Nitro caprylic acid.	$C_8 H_{15} N O_4$.	1.093, 18.°		
[2] Ethyl nitro caprylate.	$C_{10} H_{19} N O_4$.	1.031, 18.°		
[3] " nitro lactate.	$C_5 H_9 N O_5$.	1.1534, 13.°	178.°	
[4] " nitro malate.	$C_8 H_{13} N O_7$.	1.2024, 16.°		
[5] " nitro tartrate.	$C_8 H_{12} N_2 O_{10}$.	1.2778, melted.		45°–46.°
[6] Nitro glycerine.	$C_3 H_5 N_3 O_9$.	1.595,–1.60, 15.°		
[7] "	"	1.5958.		
[8] "	"	1.60.		
[9] "	"	1.60.		
[10] Nitroso diethyline.	$C_4 H_{10} N_2 O$.	.951, 17°5.	176°9.	
[11] Methyl nitrobenzoate.	$C_8 H_7 N O_4$.		279.°	70.°
[12] Ethyl "	$C_9 H_9 N O_4$.		298.°	42.°
[13] Nitrobenzol.	$C_6 H_5 N O_2$.	1.209, 15.°	213.°	s. 3.°
[14] "	"	1.2002, 0.°	219°–220.°	
[15] "	"	1.1866, 14°4.		
[16] Nitrotoluol.	$C_7 H_7 N O_2$.	1.18, 16°5.°	225.°	
[17] " Ortho.	"	1.168, 22.°	230°–231.°	
[18] " Meta.	"	1.163, 23°5.	222°–223.°	
[19] " "	"	1.162, 23.°		
[20] Nitroxylol. Beta.	$C_8 H_9 N O_2$.	1.126, 17°5.	237°–239.°	2.°
[21] " "	"	1.126, 24°5.	227°–228.°	
[22] " Alpha.	"	1.124, 25.°	245°–246.°	
[23] Dinitro benzol.	$C_6 H_4 N_2 O_4$.			87.°
[24] Dinitro aniline.	$C_6 H_5 N_3 O_4$.			175.°
[25] Mono nitro methyl phenol.	$C_7 H_7 N O_3$.	1.249, 26.°	265.°	9.° rs. 0.°
[26] Nitro isobutylanisol. Para.	$C_{10} H_{12} N O_6$.	1.1361, 20.°	275°–280.°	
[27] " " Ortho.	"	1.1046, 20.°	285°–290.°	
[28] Nitroethane. Isomer of ethyl nitrite.	$C_2 H_5 N O_2$.	1.0582, 13.°	113°–114.°	

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3d. MISCELLANEOUS COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl cyanate.	$C_2 H_3 N O$.		a. 40.°	
[2] Ethyl "	$C_3 H_5 N O$.	.8981.	60.°	
[3] Amyl "	$C_6 H_{11} N O$.		a. 100.°	
[4] Allyl "	$C_4 H_5 N O$.		82.°	
[5] Phenyl "	$C_7 H_5 N O$.	1.092, 50.°	163.°	
[6] Methyl cyanurate.	$C_6 H_9 N_3 O_3$.		274.°	175°–176°
[7] Ethyl "	$C_9 H_{15} N_3 O_3$.		253.°	95.°
[8] Aceto-ethyl nitrate.	$C_6 H_{14} N_2 O_7$.	1.0451, 19.°	84°–86.°	
[9] Valeracetonitrile.	$C_{26} H_{48} N_4 O_6$.	.79.	68°–70.°	
[10] Trioxamylidene.	$C_{15} H_{33} N O_3$.	.879, 22.°		
[11] Cyanetholine.	$C_3 H_5 N O$.	1.1271, 15.°		
[12] Acetamide. s.	$C_2 H_5 N O$.	1.11–1.13, 14.°		
[13] Ethyl formamide.	$C_3 H_7 N O$.	.967, 2.°	199.°	
[14] " acetamide.	$C_4 H_9 N O$.	.942, 4°5.	205.°	
[15] " diacetamide.	$C_6 H_{11} N O_2$.	1.0092, 20.°	185°–192.°	
[16] Mucamide. s.	$C_6 H_{12} N_2 O_6$.	1.589, 13°5.		
[17] Acetanilide. s.	$C_8 H_9 N O_2$.	1.099, 10°5.	295.°	101.°
[18] Urethane. } s.	$C_3 H_7 N O_2$.	.9862, 21.°		
[19] Ethyl urethane. }	$C_5 H_{11} N O_2$.	.9862, 21.°	174°–175.°	
[20] Asparagine.	$C_4 H_8 N_2 O_3 . H_2 O$	1.519, 14.°		
[21] Aspartic acid. Active.	$C_4 H_7 N O_4$.	1.6613. }		
[22] " " Inactive.	"	1.6632. }		
[23] Hippuric acid. s.	$C_9 H_9 N O_3$.	1.308.		
[24] Ethyl hippurate. s.	$C_{11} H_{13} N O_3$.	1.043, 23.°		44.°s. 32.°
[25] Urea.	$C H_4 N_2 O$.	1.30, 12.°		
[26] "	"	1.35.		
[27] "	"	1.35.		
[28] Benzoyl hydride hydrocyanate.	$C_8 H_7 N O$.	1.124.	d. 170.°	
[29] Mono amido methyl phenol.	$C_7 H_9 N O$.	1.108, 26.°	216.°	
[30] ——————?	$C_6 H_{14} N_2 O$.	.924, 14.°	200°–205.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Cyanoïl.	$C_6 H_{11} N O$. (?)	1.009.		
[2] Nitroxyl piperidine.	$C_5 H_{10} N_2 O$.	1.0659, 15°5.	240.° p. d.	
[3] Piperine.	$C_{17} H_{19} N O_3$.	1.1931, 18.°		100°+.
[4] Caffeine.	$C_8H_{10}N_4O_2.H_2O$	1.23, 19.°		
[5] "	"		Subl. 184°7.	177°8.
[6] Creatine hydrate.	$C_4H_9N_3O_2.H_2O$.	1.34–1.35.		
[7] Codeine.	$C_{18}H_{21}NO_3.H_2O$	1.300.		
[8] Morphia butyrate.	$C_{42} H_{54} N_2 O_{10}$.	1.215, 13.°		
[9] " oxalate.	$C_{36}H_{38}N_2O_9.2aq.$	1.286, 15.°		
[10] " lactate.	$C_{40} H_{50} N_2 O_{12}$.	1.3574.		
[11] Indigo blue.	$C_8 H_5 N O$.	1.35.		

XLIII. Metallic Salts of Organic Acids.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[12] Lead formate.	$Pb\,C_2 H_2 O_4$.	4.56, 11.°		
[13] Copper "	$Cu\,C_2 H_2 O_4$. 2 aq.	1.815, 20.°		
[14] Sodium acetate.	$Na\,C_2 H_3 O_2$.	1.421, 14.°		
[15] " "	$Na\,C_2 H_3 O_2$. 6 aq.	1.420.		
[16] " "	"	1.40, 12.°		
[17] Silver "	$Ag\,C_2 H_3 O_2$.	3.128.		
[18] Lead "	$Pb(C_2H_3O_2)_2.3$ aq.	2.496.		
[19] Barium "	$Ba(C_2H_3O_2)_2.H_2O$.	2.19, 13°.		
[20] Copper "	———	1.914, 20.°		
[21] Zinc "	$Zn(C_2H_3O_2)_2.3$ aq.	1.7175, 12.°		
[22] Sodio uranic acetate.	$Na\,C_2 H_3 O_2$. + $2(U\,C_2 H_3 O_3)$.	2.55, 12.°		
[23] " " "				
[24] Cupro calcium "		1.4206.		
[25] Potassium oxalate.	$K_2 C_2 O_4.H_2 O$.	2.104, m. of 2.		
[26] " "	"	2.08.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ammonium oxalate.	$Am_2 C_2 O_4 . H_2 O$.	1.461, m. of 2.		
[2] " "	"	1.475.		
[3] " "	"	1.470.		
[4] Silver "	$Ag_2 C_2 O_4$.	4.96, 10.°		
[5] Thallium "	$Tl_2 C_2 O_4$.	6.31.		
[6] Hydrogen sodium oxalate	$Na H C_2 O_4 . H_2 O$.	2.315.		
[7] " potassium "	$K H C_2 O_4$.	1.965, m. of 2.		
[8] " " "	"	2.030.		
[9] " " "	"	2.088.		
[10] " ammonium "	$Am H C_2 O_4 . H_2 O$.	1.563, m. of 3.		
[11] " " "	"	1.556.		
[12] " thallium "	$Tl H C_2 O_4 . H_2 O$.	3.971.		
[13] Potassium quadroxalate	$K H_3 C_4 O_8 . 2 H_2 O$.	1.817.		
[14] " "	"	1.765.		
[15] " "	"	1.836.		
[16] Ammonium "	$Am H_3 C_4 O_8 . H_2 O$.	1.589, m. of 2.		
[17] " "	"	1.607.		
[18] Potassium copper oxalate	$K_2 Cu C_4 O_8 . 2 H_2 O$.	2.288, m. of 2.		
[19] Ammonium " "	$Am_2 Cu C_4 O_8 . 2 H_2 O$.	1.923.		
[20] Uranium oxalate.	$U_2 O_2 . C_2 O_4 . 3 H_2 O$.	2.98.		
[21] Whewellite.	$Ca C_2 O_4$.	2.50–2.75.		
[22] Humboldtine.	$2 Fe C_2 O_4 . 3 H_2 O$.	2.13–2.489.		
[23] Ammonium succinate.	$Am_2 C_4 H_4 O_4$.	1.367, 10.°		
[24] Silver "	$Ag_2 C_4 H_4 O_4$.	3.518, 10.°		
[25] Lead "	$Pb C_4 H_4 O_4$.	3.800, 10.°		
[26] Sodium tartrate.	$Na_2 C_4 H_4 O_6 . 4 H_2 O$.	1.794.		
[27] Potassium "	$K_2 C_4 H_4 O_6$.	1.975.		
[28] " "	$K_2 C_4 H_4 O_6 . H_2 O$.	1.960.		
[29] Ammonium tartrate.	$Am_2 C_4 H_4 O_6$.	1.566.		
[30] " "	"	1.523.		
[31] Silver "	$Ag_2 C_4 H_4 O_6$.	3.4321.		
[32] Thallium "	$(Tl_2 C_4 H_4 O_6)_2 . H_2 O$.	4.658.		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hydrogen potassium tartrate.	$K\,H.\,C_4\,H_4\,O_6$.	1.943.		
[2] " " "	"	1.973.		
[3] " " "	"	1.956.		
[4] " ammonium "	$Am\,H.\,C_4\,H_4\,O_6$.	1.680.		
[5] " thallium "	$Tl\,H.\,C_4\,H_4\,O_6$.	3.496.		
[6] Sodium potassium "	$Na\,K.\,C_4\,H_4\,O_6.\,4\,H_2\,O$.	1.74.		
[7] " " "	"	1.767.		
[8] " " "	"	1.790.		
[9] " ammonium "	$Na\,Am.\,C_4\,H_4\,O_6.4H_2O$.	1.58.		
[10] " " "	"	1.576.		
[11] " " "	"	1.587.		
[12] Potassium " "	$K\,Am.\,C_4\,H_4\,O_6.\,4\,H_2O$.	1.700.		
[13] Potassium tartar emetic.	$(K(SbO)C_4H_4O_6)_2.H_2O$.	2.5569.		
[14] " " "	"	2.607.		
[15] " " "	"	2.588.		
[16] Thallium " "	$(Tl(SbO)C_4H_4O_6)_2.H_2O$.	3.99.		
[17] Potassium racemate.	$K_2\,C_4\,H_4\,O_6.\,2\,H_2\,O$.	1.58.		
[18] Silver "	$Ag_2\,C_4\,H_4\,O_6$.	3.7752.		
[19] Thallium "	$(Tl_2\,C_4\,H_4\,O_6)_2.\,H_2\,O$.	4.659.		
[20] Racemo-emetic.	$(K(SbO)C_4H_4O_6)_2.H_2O$.	2.4768.		
[21] Silver malate.	$Ag_2\,C_4\,H_4\,O_5$.	4.0016.		
[22] Hydrogen ammonium malate.	$Am\,H.\,C_4\,H_4\,O_5$.	1.55.		
[23] Thallium picrate.	$Tl\,C_6\,H_2\,(N\,O_2)_3\,O$.	3.039.		
[24] Calcium hippurate.	$2(CaC_{18}H_{16}N_2O_6).3H_2O$.	1.318.		
[25] Potassium borotartrate.	$K\,B\,O_2.\,C_4\,H_4\,O_5$.	1.832.		

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XLIV. Compounds Containing C, H, and Cl.

Including the Chlorides of Carbon Produced by Substitution.

1st. CHLORIDES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methyl chloride.	$C H_3 . Cl.$		-20° to -22.°	
[2] Ethyl "	$C_2 H_5 . Cl.$	.874, 5.°	12.°	
[3] " "	"	.92138, 0.°	11.°	
[4] " "	"		11°-12.°	
[5] " "	"	.9253, 0.°	11°-13.°	
[6] " "	"	.9176, 8.°	12°18.	
[7] Propyl "	$C_3 H_7 . Cl.$		a. 40.°	
[8] " " iso.	"	.874, 10.°	36°-38.°	
[9] " "	"		52.°	
[10] " "	"	.9156, 0.°		
[11] " "	"	.8918, 19°75.	46°5.	
[12] " "	"	.8671, 39.°		
[13] Butyl "	$C_4 H_9 . Cl.$		70°-75.°	
[14] " "	"	.880.	70.°	
[15] " "	"		65°-70.°	
[16] " "	"	.9074, 0.°	77°6.	
[17] " "	"	.8874, 20.°	741.3 m. m.	
[18] " "	"	.8953, 0.°		
[19] " "	"	.8651, 27°8	69.°	
[20] " "	"	.8281, 59.°		
[21] Amyl "	$C_5 H_{11} . Cl.$		102.°	
[22] " "	"		100°-101.°	
[23] " "	"	.8859, 0.°		
[24] " "	"	.8625, 25°1.	100°6-101.°	
[25] " "	"	.89584, 0.°	101°75.°	
[26] " " iso.	"	.883, 0.°	90.°	
[27] " "	"		98°-103.°	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Amyl chloride.	$C_5H_{11}.Cl.$	.9013, 0.°	106°6.	
[2]	" "	"	.8834, 20.°		
[3]	" "	"	.868, 40.°	739.8 m. m.	
[4]	" "	"	8750, 20.°	101.°	
[5]	" "	"	.8777, 20.°	101.°	
[6]	Hexyl "	$C_6H_{13}.Cl.$	.892, 16.°	125°–128.°	
[7]	" " Beta.	"		120°–130.°	
[8]	" "	"	.892, 23.°	125°–130.°	
[9]	" " iso.	"	.8943, 14.°		
[10]	" " "	"	.8874, 22.°	122.°	
[11]	" " "	"	.8759, 34.°		
[12]	Heptyl "	$C_7H_{15}.Cl.$	.9983, 15.°	175.°	
[13]	" "	"	.890, 20.°	148°–152.°	
[14]	" " From Azelaic Acid.	"	.8737, 18°5.	151°–153.°	
[15]	" "	"	.8725, 20.°		
[16]	" "	"	.8814, 16°5.		
[17]	" " From Ethyl amyl.	"	.8780, 18°5.	146°–148.°	
[18]	" "	"	.8757, 22.°		
[19]	" " From petroleum.	"	.8965, 19.°	149.°	
[20]	" "	"	.891, 19.°	150°–152.°	
[21]	Octyl "	$C_8H_{17}.Cl.$		175.°	
[22]	" "	"	.892, 18.°	170°–172.°	
[23]	" "	"	.895, 16.°	168°–172.°	
[24]	" "	"		162°–167.°	
[25]	" "	"	.8802, 16.°	179°5–180°5.	
[26]	" " iso.	"	.8834, 10°5.	165.°	
[27]	" " "	"	.8617, 36.°		
[28]	Nonyl "	$C_9H_{19}.Cl.$	.899, 16.°	196.°	
[29]	Decyl "	$C_{10}H_{21}.Cl.$		200°–204.°	
[30]	" "	"		190°–200.°	
[31]	Dodecatyl "	$C_{12}H_{25}.Cl.$	.933, 22.°	242°–245.°	
[32]	Myristyl "	$C_{14}H_{29}.Cl.$		280.°	
[33]	Cetyl "	$C_{16}H_{33}.Cl.$	.8412, 12.°	289.° p. d.	

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2d. CHLORIDES OF THE ETHYLENE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Methylene chloride.	$CH_2.Cl_2$.		40°–42.°	
[2] " "	"	1.360, 0.°	39°5–40°5.	
[3] Ethylene "	$C_2H_4.Cl_2$.	1.256, 12.°	82°5.	
[4] " "	"		86.°	
[5] " "	"	1.247, 18.°	82°4.	
[6] " "	"		85°8.	
[7] " "	"	1.28034, 0.°	84°92.	
[8] " "	"		85.°	
[9] " "	"	1.2562, 20.°	85.°	
[10] " "	"	1.26, 14.°	85.°	
[11] Propylene "	$C_3H_6.Cl_2$.		100°–103.°	
[12] " "	"	1.151.	104.°	
[13] Butylene "	$C_4H_8.Cl_2$.	1.112, 18.°	123.°	
[14] " "	"	1.0953, 0.°	122°3.	
[15] " "	"	1.0751, 20°7.		
[16] Amylene "	$C_5H_{10}.Cl_2$.	1.058, 9.°	141°–147.°	
[17] " "	"	1.2219, 0.°	145.°	
[18] Heptylene "	$C_7H_{14}.Cl_2$.		191.°	
[19] " "	"	1.0295, 10.°		
[Isomers of some of the above compounds may be found in the next table.]				

3d. SUBSTITUTION DERIVATIVES OF THE TWO PRECEDING SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[20] Chlorinated methyl chloride.	CH_2Cl_2.	1.344, 18.°	30°5.	
[21] Chloroform.	$CHCl_3$.		70.°	
[22] "	"	1.48, 18.°	60°8.	
[23] "	"	1.491, 17.°	61.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloroform.	C H Cl_3.	1.493–1.497.		
[2] "	"	1.413. } Two		
[3] "	"	1.496, 12.° } products.		
[4] "	"	1.500, 15°5.		
[5] "	"	1.52523, 0.°	63°5.	
[6] "	"	1.512, 12.°		
[7] "	"	1.49.		
[8] "	"	1.472, 16°5.		
[9] "	"	1.507, 17.°		
[10] Chlorinated ethyl chloride.	C_2 H_4 Cl_2.	1.174, 17.°	64.°	
[11] " " "	"		58.	
[12] " " "	"	1.24074, 0.°	64°8.	
[13] " " "	"	1.189, 4°3.	59°–61.°	
[14] " " "	"	1.198, 6°5.°	57°–59.°	
[15] " " "	"		62.°	
[16] Dichlorinated " "	C_2 H_3 Cl_3.	1.372, 16.°	75.°	
[17] " "	"	1.34651, 0.°	74°9.	
[18] " "	"		74°5.	
[19] Chlorinated ethylene chloride.	C_2 H_3 Cl_3.	1.422, 17.°	115.°	
[20] " " "	"	1.42234, 0.°	114°2.	
[21] Trichlorinated ethyl chloride.	C_2 H_2 Cl_4.	1.530, 17.°	102.°	
[22] Bichlorinated ethylene chloride.	C_2 H_2 Cl_4.	1.576, 19.°	135.°	
[23] " "	"	1.61158, 0.°	138°6.	
[24] " "	"	1.614, 0.°	147.°	
[Compare the above with acetylene tetrachloride.]				
[25] Pentachloro dimethyl.	C_2 H Cl_5.	1.663, 0.°	153.°	
[26] " "	"	1.644.	146.°	
[27] " "	"	1.66267, 0.°	153°8.	
[28] " "	"	1.71, 0.° }	158.°	
[29] " "	"	1.69, 13.° }		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dicarbon hexachloride.	$C_2 Cl_6$.	1.619.	122.°	
[2] " "	"			182°–183°
[3] Dichlorinated ethylene.	$C_2 H_2 Cl_2$.	1.250, 15.°	35°–40.°	
[4] Chlorinated propylene.	$C_3 H_5 Cl$.		30.°	
[5] " "	"	.918, 9.°	23.°	
[6] " "	"	.9307, 0.°	25°5.	
[7] " "	"	.931, 0.°	23.°	
[Compare with allyl chloride.]				
[8] Iso trichloro propylene.	$C_3 H_3 Cl_3$.	1.387, 14.°	115.°	
[Compare with chloro dichlorglycide.				
[9] Chlorinated propylene chloride.	$C_3 H_5 Cl_3$.	1.347.	170.°	
[Compare with allyl trichloride.]				
[10] Dichlorinated propylene chloride.	$C_3 H_4 Cl_4$.	1.548.	195°–200.°	
[Compare with tetrachloroglycide, and dichloracetone chloride.]				
[11] Trichlorinated propylene chloride.	$C_3 H_3 Cl_5$.		220°–225.°	
[Compare with trichloracetone chloride.]				
[12] Tetrachlorinated propylene chloride.	$C_3 H_2 Cl_6$.	1.626.	240°–245.°	
[13] Pentachlorinated propylene chloride.	$C_3 H Cl_7$.	1.731.	260.°	
[14] Hexchlorinated propylene chloride.	$C_3 Cl_8$.	1.860.	280.°	
[15] Chlorinated amyl chloride.	$C_5 H_{10} Cl_2$.	1.05, 24.°	a. 130.°	
[16] " " "	"	1.194, 0.°	155°–160.°	
[Compare with amylene chloride.]				
[17] Dichlorinated amyl chloride.	$C_5 H_9 Cl_3$.		160°–190.°	

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[17] Bauer. 19. 531.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dichlorinated amyl chloride.	$C_5 H_9 Cl_3$.	1.33, 13.°	185°–190.°	
[2] Chlorinated amylene.	$C_5 H_9 Cl$.	.9992, 0.°	90°–95.°	
[3] Dichlorinated amylene chloride.	$C_5 H_8 Cl_4$.	2.4292.	220°–230.°	
[4] Chlorinated hexyl chloride. [Compare with hexylene chloride.]	$C_6 H_{12} Cl_2$.	1.087, 20.°	180°184.°	
[5] Dichlorinated hexyl chloride.	$C_6 H_{11} Cl_3$.	1.193, 21.°	215°–218.°	
[6] Pentachlorinated hexyl chloride.	$C_6 H_8 Cl_6$.	1.598, 20.°	285°–290.°	
[7] Chlorinated heptyl chloride.	$C_7 H_{14} Cl_2$.		190.°	
[8] Chlorinated heptylene.	$C_7 H_{13} Cl$.		155.°	
[9] Chlorinated diamylene chloride.	$C_{10} H_{19} Cl_3$.	1.1638, 0.°	240°–250.°	

4th. DERIVATIVES OF THE BENZOL SERIES, INCLUDING ISOMERS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[10] Mono chloro benzol, or [11] Phenyl chloride.	$C_6 H_5 Cl$.		137.°	
	"		136.°	
[12] " "	"	1.1499, 0.°		
[13] " "	"	1.1347, 10.°	132°5.	
[14] " "	"	1.1258, 20.°	767 m. m.	
[15] " "	"	1.1188, 30.°		
[16] " "	"	1.1199, 0.°		
[17] " "	"	1.1085, 10.°	136.°	
[18] " "	"	1.099, 20.°	767 m. m.	
[19] " "	"	1.092, 30.°		
[20] " "	"	1.118.		

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[13] Sokoloff. 18. 517.
[14] Sokoloff. 18. 517.
[15] From benzol.
[16] Sokoloff. 18 517.
[17] Sokoloff. 18. 517.
[18] Sokoloff. 18. 517.
[19] From phenol.
[20] Jungfleisch. 19. 551.

	Name.		Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Mono chloro benzol.		$C_6 H_5 Cl$.	1.177,–40.°		
[2]	" "		"	.980, 133.°		
[3]	" "		"	1.1293, 0.°	138.°	—40.°
[4]	Dichloro benzol.		$C_6 H_4 Cl_2$.	1.459.		
[5]	"	s.	"	1.250, 53.°		
[6]	"		"	1.123, 171.°		
[7]	"	s.	"	1.4581, 20°5.		
[8]	"		"	1.241, 63.°	171.°	53.
[9]	"		"	1.2062, 93.°		
[10]	"		"	1.1366, 166.°		
[11]	Trichloro benzol.		$C_6 H_3 Cl_3$.	1.457, 7.°	210.°	
[12]	"		"	1.575.		
[13]	"	s.	"	1.457, 17.°		
[14]	"		"	1.227, 206.°		
[15]	"	s.	"	1.574, 10.°		
[16]	"	l.	"	1.4658, 10.°		
[17]	"		"	1.4460, 26.°	206.°	17.°
[18]	"		"	1.4111, 56.°		
[19]	"		"	1.2427, 196.°		
[20]	Tetrachloro benzol.		$C_6 H_2 Cl_4$.	1.748.		
[21]	"		"	1.448, 139.°		
[22]	"		"	1.315, 240.°		
[23]	"	s.	"	1.7344, 10.°		
[24]	"		"	1.4339, 149.°		
[25]	"		"	1.3958, 179.°	240.°	139.°
[26]	"		"	1.3281, 230.°		
[27]	Pentachloro benzol.		$C_6 H Cl_5$.	1.625, 74.°	270.°	
[28]	"		"	1.370, 270.°		
[29]	"		"	1.8422, 10.°		
[30]	"		"	1.8342, 16°5.		
[31]	"		"	1.6091, 84.°	272.°	74.°
[32]	"		"	1.5732, 114.°		
[33]	"		"	1.3824, 261.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pentachloro benzol. Two	$C_6 H Cl_5$.			85.°
[2] " modifications.	"			198°–199.°
[3] Hexchloro benzol.	$C_6 Cl_6$.			231.°s. 226°
[4] "	"	1.585, 228.°		
[5] "	"	1.437, 317.°		
[6] "	"	1.569, 236.°		
[7] "	"	1.5191, 266.°	326.°	226.°
[8] "	"	1.4624, 306.°		
[9] Monochlorotoluol.	$C_7 H_7 Cl$.	1.117, 0.°	175°–176.°	
[10] "	"	1.080, 14.°	164.	
[11] "	"		157°–158.°	
[12] Benzyl chloride.	"	1.1131–1.1179.		
[13] " "	"	1.107, 14.°	183.°	
[14] Dichlorotoluol.	$C_7 H_6 Cl_2$	1.245, 16.°	206.°	
[15] "	"		206.°	
[16] "	"	1.256, 13.°	202.°	
[17] "	"	1.2557, 14.°	207.	
[18] Dichlorinated benzyl chloride.	$C_7 H_5 Cl_3$	1.44, 0.°	135°–145.° 10 m. m.	
[19] " "	"		240° p. d. 760 m. m.	
[20] Chlorinated dichlor-toluol.	"	161, 13.°	216°–218.°	
[21] Benzo trichloride.	"	1.380, 14.°	224.°	
[22] Tetrachlorotoluol.	$C_7 H_4 Cl_4$.		270.°	92°–95.°
[23] "	"	1.495, 14.°	255.°	
[24] Dichlorotoluol dichlo-ride.	"	1.518, 22.°	257.°	
[25] Trichlortoluol chloride.	"	1.547, 23.°	273.°	
[26] Dichlorinated chloro-benzol.	"	1.74, 13.°	244°–246.°	
[27] " "	"	1.76, 13.°	246°–248.°	
[28] Chlorosalylic trichloride	"	1.51, l.	260.°	30.°
[29] Pentachlorotoluol.	$C_7 H_3 Cl_5$.		300.°	218.°

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dichlortoluol trichloride.	$C_7 H_5 Cl_5$.	1. 587,21.°	273.°	
[2] Trichlortoluol dichloride.	«	1.607, 22.°	280°–281.°	s. 0.°
[3] Tetrachlortoluol chloride.	«	1.634, 25.°	296°–297.°	
[4] « dichloride.	$C_7 H_2 Cl_6$.	1.704, 25.°	305°–306.°	
[5] Monochloroxylol.	$C_8 H_9 Cl$.		193.°	
[6] «	«		190°–195.°	
[7] Dichloroxylol.	$C_8 H_8 Cl_2$.		240°–245.°	100.°
[8] «	«		222.	
[9] Trichloroxylol.	$C_8 H_7 Cl_3$.		254°–256.°	

5th. MISCELLANEOUS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[10] Allyl chloride.	$C_3 H_5 Cl$.	.934, 0.°	44°–45.°	
[11] « «	«	.9547, 0.°	45.5°–47.°	
[Compare with chlorinated propylene.]				
[12] Allyl trichloride.	$C_3 H_5 Cl_3$.	1.41, 0.°	154°–157.°	
[13] Allylene chloride.	$C_3 H_4 Cl_2$.	1.170, 24°5.	84°4.	
[14] Acetylene tetrachloride.	$C_2 H_2 Cl_4$.	1.614, 0.°		
[15] « «	«	1.578, 24°3.	147.°	
[16] « «	«	1.522, 100°1.		
[17] Methylchloracetol.	$C_3 H_6 Cl_2$.	1.117, 0.°	70.°	
[18] «	«	1.06, 16.°	69.°	
[Compare with propylene chloride.]				
[19] Epidichlorhydrin.	$C_3 H_4 Cl_2$.		120.°	
[20] «	«	1.21, 20.°	101°–102.°	
[21] Tetrachloroglycide.	$C_3 H_4 Cl_4$.	1.496, 17.°	164.°	
[Compare with dichlorinated propylene chloride.]				

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloro dichloroglycide. [Compare with isotrichloropropylene.]	$C_3 H_3 Cl_3$.	1.414, 20.°	142.°	
[2] (?) s.	$C_3 H_4 Cl_4$.	1.55.	185.°	145.°
[3] Chlorostyrol. Beta.	$C_8 H_7 Cl$.	2.112, 22°3.	199°–204.°	
[4] Chloroanethol.	$C_{10} H_{12} Cl_2$.	1.1154, 0.°	257.°	—6.°
[5] Chloronicene.	$C_5 H_5 Cl$.	1.141, 10.°	292°–294.°	
[6] Naphtyl chloride.	$C_{10} H_7 Cl$.	1.2052, 6°2.	259°–262.°	
[7] " "	"	1.2028, 6°4.	a. 260.°	
[8] Camphryl "	$C_9 H_{13} Cl$.	1.038, 14.°	205.°	
[9] Geraniol "	$C_{10} H_{17} Cl$.	1.020, 20.°		
[10] Caoutchin hydrochlorate.	$C_{10} H_{17} Cl$.	1.433.		
[11] Deriv. of oil of Pinus pumilio.	$C_{10} H_{17} Cl$.	.982, 17.°		
[12] Deriv. of oil of Muscat nuts.	$C_{10} H_{17} Cl$.	9827, 15.°	194.°	
[13] Deriv. of Bergamot oil.	$6(C_{10}H_{16})2HCl.H_2O$	896.		

XLV. Compounds Containing C. H. O. Cl. and C. O. Cl.

1st. SUBSTITUTION COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Dichlorinated methyl oxide	$C_2 H_4 Cl_2 O$.	1.315, 20.°	105.°	
[15] Tetrachlorinated " "	$C_2 H_2 Cl_4 O$.	1.606, 20.°	a. 130.°	
[16] Hexchlorinated " "	$C_2 Cl_6 O$.	1.594.	a. 100.°	
[17] Dichlorinated ethyl "	$C_4 H_8 Cl_2 O$.	1.174, 23.	140°–147.°	
[18] Tetrachlorinated " "	$C_4 H_6 Cl_4 O$.	1.5008.		
[19] Perchlorinated " "	$C_4 Cl_{10} O$.			69.°
[20] " " "	"	1.9, 14°5.	300.° d.	69.°
[21] Pentachlorinated " "	$C_4 H_5 Cl_5 O$.	1.645.		
[22] Monochloracetic acid.	$C_2 H_3 Cl O_2$.	1.366, 73.° / H_2O at 19°—1.	185°–187°5.	s. 62.°
[23] " "	"	1.3947, 73.° / H_2O at 73°—1.	755·7. m. m.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dichloracetic acid. l.	$C_2H_2Cl_2O_2$.	1.5216, 15.°	195.°	
[2] Trichloracetic " l.	$C_2HCl_3O_2$.	1.617, 46.°	195°–200.°	46.°
[3] " "	"		195.°	52°3.s.44°8.
[4] Chloropropionic acid.	$C_3H_5ClO_2$.	1.28, 0.°	186.°	
[5] Chlorocarbonic ether.	$C_3H_5ClO_2$.	1.133, 15.°	94.°	
[6] Tetrachlorinated methyl formate.	$C_2Cl_4O_2$.	1.724, 12.°	180°–185.°	
[7] Dichlorinated ethyl "	$C_3H_4Cl_2O_2$.	1.261, 16.°		
[8] Hexchlorinated " "	$C_3Cl_6O_2$.	1.705, 18.°	200.°	
[9] Dichlorinated methyl acetate.	$C_3H_4Cl_2O_2$.	1.25.	145°–148.°p.d.	
[10] Hexchlorinated " "	$C_3Cl_6O_2$.	1.691, 18.°	200.°	
[11] Dichlorinated ethyl "	$C_4H_6Cl_2O_2$.	1.301, 12.°	110.°	
[12] " " "	"	1.29.	153.°	
[13] Trichlorinated " "	$C_4H_5Cl_3O_2$.	1.367.	164.°	
[14] " " "	"	1.35, 20.°	164.°	
[15] Tetrachlorinated " "	$C_4H_4Cl_4O_2$.	1.485, 25.°		
[16] Hexchlorinated " "	$C_4H_2Cl_6O_2$.	1.698, 23°5.		
[17] Heptachlorinated " "	$C_4HCl_7O_2$.	1.692, 24°5.		
[18] Perchlorinated " "	$C_4Cl_8O_2$.	1.79, 25.°	245.°	
[19] " " "	"	1.78, 22.°		
[20] Chloropropionic ether.	$C_5H_8Cl_2O_2$.	1.2493, 0.°	160.°	
[21] Chlorobutyric "		1.063, 17°5.	156°–160.°	
[22] Chloroenanthic "		1.2912, 16°5.		
[23] Monochloracetone.	C_3H_5ClO.	1.19.	119.°	
[24] "	"	1.14, 14.°	117.°	
[25] "	"	1.162, 16.°	119.°	
[26] "	"	1.18, 16.°	118°–120.°	
[27] Dichloracetone.	$C_3H_4Cl_2O$.	1.331.		
[28] "	"		116°5.	
[29] "	"	1.236, 21.°	121°5.°	
[30] "	"		120.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Pentachloracetone.	$C_3 H Cl_5 O$.	1.6–1.7.	a. 190.°	
[2] Hexchloracetone.	$C_3 Cl_6 O$.	1.75, 10.°	200°–201.°	
[3] "	"	1.744, 12.°	204.°	
[4] Monochloracetal.	$C_6 H_{13} Cl O_2$.	1.0195.	150°–160.°	
[5] Dichloracetal.	$C_6 H_{12} Cl_2 O_2$.	1.1383, 14.°	a. 180.°	
[6]	$C_5 H_{11} Cl O_2$.	1.056, 13°5.	a. 137.°	
[7] Deriv. of chlorinated ether	$C_5 H_{11} Cl O$.	.9842, 0.°	117°–118.	
[8] " " " "	$C_6 H_{13} Cl O$.	.9735, 0.°	137.°	
[9] Monochloraldehyde.	$C_2 H_3 Cl O$.	1.23.		
[10] Perchloraldehyde.	$C_2 Cl_4 O$.	1.603, 18.°	118.°	
[11] Chloroxethose.	$C_4 Cl_6 O$.	1.654, 21.°	210.°	
[12] Parachloralide.	$C_5 H_2 Cl_6 O_3$.	1.5765, 14.°	182.°	
[13] Chloral.	$C_2 H Cl_3 O$.	1.502, 18.°	94.°	
[14] "	"	1.5183, 0.°	98°1–99.°	
[15] "	"	1.4903, 22°2.		
[16] Chloral hydrate.			145.°	56.°
[17] " "			145.°	50.°
[18] " "			115.°	s. 40°2.
[19] " methylate.			98.°	
[20] " ethylate.		1.143, 40.° l.	115°–116.°	s. 40.°
[21] " amylate.		1.234, 25.°	143.°	24.°
[22] Chlorolactic ether.	$C_5 H_9 Cl O_2$.	1.097, 0.°	144.°	
[23] Chloromaleic "	$C_8 H_{11} Cl O_4$.	1.15, 11.°	250°–260.°	
[24] Chloroniceic "	$C_8 H_9 Cl O_2$.	.981, 10.°	230.°	
[25] " acid.	$C_6 H_5 Cl O_2$.	1.29, melted.	215.°	150.°
[26] Deriv. of benzoic ether.	$C_{18} H_{16} Cl_6 O_2$.	1.346, 10°8.	188°–190.°	
[27] Tetrachlor. ethyl camphorate.	$C_{14} H_{20} Cl_4 O_4$.	1.386, 14.°		
[28] Deriv. of oleic acid.	$C_{18} H_{32} Cl_2 O_2$.	1.082, 7°9.	Begins, 190.°	
[29] " sodium citrate.	$C_5 Cl_{10} O_2$.	1.66.	190.°	
[30] " dichlortoluol.	$C_9 H_{11} Cl O$.	1.121, 14.°	215°–220.°	
[31] Monochlor methylphenol	$C_7 H_7 Cl O$.	1.182, 9.°	200.°	
[32] Monochlor ethyl phenol.	$C_8 H_9 Cl O$.	1.106, 9.°	210.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloracetyl chloride.	$C_2 H_2 Cl_2 O$.	1.495, 0.°	105.°	
[2] Chlorbutyryl "	$C_4 H_6 Cl_2 O$.	1.257, 17.°	129°–132.°	
[3] Methyl chlorphenetol. *a*.		1.127, 19°.5.	210°–220.°	
[4] " *β*.		1.131, 18.°	210°–220.°	

2d. CHLORHYDRINS.

For Trichlorhydrin and Epidichlorhydrin, See Compounds of C. H. and Cl.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[5] Mono-chlorhydrin.	$C_3 H_7 Cl O_2$.	1.31.	227.°	
[6] Di-chlorhydrin.	$C_3 H_6 Cl_2 O$.	1.37.		
[7] " "	"		180.°	
[8] " "	"	1.3699, 9.°	175°–180.°	
[9] " "	"	1.355, 17°.5.	180°–183.°	
[10] Epi-chlorhydrin.	$C_3 H_5 Cl O$.	1.204, 0.°	117.°	
[11] " "	"	1.194, 11.°	118°–119.°	
[12] Amyl-chlorhydrin.	$C_8 H_{17} Cl O_2$.	1.00, 20.°	235.°	
[13] Diethyl-chlorhydrin.	$C_7 H_{15} Cl O_2$.	1.03, 10°.5.		
[14] " "	"	1.005, 17.°	184.°	
[15] Diethyl glycol chlorhydrin	$C_{10} H_{21} Cl O_4$.	1.11, 17.°	285.°	
[16] Propyl " "	$C_3 H_7 Cl O$.	1.1302, 0.°	127.°	
[17] " " " iso.	"	1.247.	126°–128.°	
[18] Propyl phycite trichlorhydrin.	$C_3 H_5 Cl_3 O$.	1.4324, 14.°	172°–173.°	
[19] Heptylene chlorhydrin.	$C_7 H_{15} Cl O$.	1.014, 0.°	206°–208.°	
[20] " "	"	1.001, 14.°		
[21] Octylene "	$C_8 H_{17} Cl O$.	1.003, 0.°		
[22] " "	"	.987, 31.°		
[23] " aceto chlorhydrin.	$C_{10} H_{19} Cl O_2$.	1.026, 0.°	225.°	
[24] " " "	"	1.011, 18.°		
[25] Aceto dichlorhydrin.	$C_5 H_8 Cl_2 O_2$.	1.283, 11.°	202°–203.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Butyro dichlorhydrin.	$C_7 H_{12} Cl_2 O_2$.	1.194, 11.°	226°–227.°	
[2] Valero "	$C_8 H_{14} Cl_2 O_2$.	1.149, 11.°	245.°	
[3] Diaceto "	$C_7 H_{11} Cl O_4$.	1.243, 4.°	245.°	
[4] Benzo "		1.441, 8.°		

3d. MISCELLANEOUS COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[5] Ethylidene oxychloride.	$C_4 H_8 Cl_2 O$.	1.1376. 12.°	116°–117.°	
[6] Glycol chloracetin.	$C_4 H_7 Cl O_2$.	1.1783, 0.°	145.°	
[7] " chlorbutyrin.	$C_6 H_{11} Cl O_2$.	1.0854, 0.°	a. 190.°	
[8] Acetyl chloride.	$C_2 H_3 Cl O$.	1.125, 11.°	55.°	
[9] " "	"	1.1305, 0.°	55°–56.°	
[10] " "	"	1.1072, 16.°		
[11] Propionyl chloride.	$C_3 H_5 Cl O$.		a. 80.°	
[12] Butyryl "	$C_4 H_7 Cl O$.		a. 95.°	
[13] Valeryl "	$C_5 H_9 Cl O$.	1.005, 6.°	115°–120.°	
[14] Pelargonyl "	$C_9 H_{17} Cl O$.		220.°	
[15] Allyl alcohol chloride.	$C_3 H_6 Cl_2 O$.	1.3799, 0.°	180°–184.°	
[16] " " "	"	1.3681, 11°5.		
[17] Succinyl "	$C_4 H_4 Cl_2 O_2$.	1.39.	190.°	
[18] Pyrocitryl "	$C_5 H_4 Cl_2 O_2$.	1.40, 15.°	175.°	
[19] Benzoyl "	$C_7 H_5 Cl O$.	1.196.		
[20] " "	"		195.°	
[21] " "	"	1.250, 15.°	195°–200.°	
[22] " "	"	1.2324, 0.°	198°–198°3.	
[23] " "	"	1.2142, 19.°		
[24] Toluyl "	$C_8 H_7 Cl O$.	1.175.	214°–216.°	
[25] Cumyl "	$C_{10} H_{11} Cl O$.	1.07, 15.°	258°–260.°	
[26] Cinnamyl "	$C_9 H_7 Cl O$.	1.207, 16.°	262.°	
[27] Anisyl "	$C_8 H_7 Cl O_2$.	1.261, 15.°	262.°	

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XLVI. Compounds Containing C. Cl. N.; C. H. Cl. N.; C. Cl. N. O.; and C. H. Cl. N. O.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloraceto nitrile.	$C_2 Cl_3 N$.	1.444.	81.°	
[2] Dichloro ethyl cyanide.	$C_3 H_3 Cl_2 N$.	1.431, 15.°	104°–107.°	
[3] Chlorotoluidine.	$C_7 H_8 Cl N$.	1.151, 20.°	222.°	
[4] "	"		241.°	29°5.
[5] " alpha.	"	1.1855, 20.°	238.°	
[6] " beta.	"	1.203, 19.°	237°–242.°	
[7] Parachlorotoluidine.	$C_7 H_8 Cl N$.	1.175, 18.°	236.°	
[8] Chloropicrin.	$C Cl_3 N O_2$.	1.6657.	120.°	
[9] Dinitromethylene chloride	$C Cl_2 N_2 O_4$.	1.685. 15.°	100°+.	
[10] Dichloro nitrophenol.	$C_6 H_3 Cl_2 N O_3$.	1.59.		121°–122.°
[11] Dichloro-mono-nitrin.	$C_3 H_5 Cl_2 N O_3$.	1.465, 10.°	180°–190.°	
[12] Monochloro-di-nitrin.	$C_3 H_5 Cl N_2 O_6$.	1.5112, 9.°		
[13] Nitro-chloro-benzol. *a.*	$C_6 H_4 Cl N O_2$.	1.380, 22.°	242.°	83.°
[14] " " " *a.*	"	1.377, 0.°	245.°	s. 15.°
[15] " " " *a.*	"			82.°
[16] " " " *β.*	"	1.358, 0.°	232.°	s.–5.°
[17] " " " *β.*	"	1.368, 22.°	243.°	15.°
[18] Dinitro-chloro-benzol. *a.*	$C_6 H_3 Cl N_2 O_4$.	1.697, 22.°	315.°	50.°
[19] " " " *β.*	"	1.6867, 16°5.	315.°	43.°
[20] " " "	"	1.72, 18.°		50.°
[21] Nitro-dichloro-benzol.	$C_6 H_3 Cl_2 N O_2$.	1.669, 22.°	266.°	54°5.
[22] Nitro-trichloro-benzol.	$C_6 H_2 Cl_3 N O_2$.	1.790, 22.°	288.°	57.°
[23] Dinitro-dichloro-benzol.	$C_6 H_2 Cl_2 N_2 O_4$.	1.7103, 16.°	312°, p. d.	87.°
[24] " " "	"			101°–104.°
[25] Dinitro-trichloro-benzol.	$C_6 H Cl_3 N_2 O_4$.	1.850, 25.°	335°, p. d.	103°5.
[26] Nitro-tetrachloro-benzol.	$C_6 H Cl_4 N O_2$.	1.744, 25.°	304°, p. d.	99,°
[27] Nitro-pentachloro-benzol.	$C_6 Cl_5 N O_2$.	1.718, 25.°	328°, p. d.	146.°
[28] Nitro-chloro-toluol. *a.*	$C_7 H_6 Cl N O_2$.	1.307, 18.°	243.°	
[29] " " " *β.*	"	1.3259, 18.°	253.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Nitro-dichloro-toluol.	$C_7 H_5 Cl_2 N O_2$.	1.455, 17.°	274.°	
[2] Chlorazol.	$C_4 H_3 Cl_3 N_2 O_4$.	1.555.		
[3] Derivative of protein.	$C_{12} H_{12} Cl_3 N O_4$.	1.360.		
[4] " " "	$C_2 H_2 Cl_3 N O_2$.	1.628.		
[5] Bichloramyl nitrite.	$C_5 H_9 Cl_2 N O_2$.	1.233, 12.°	90,° d.	
[6] Cinchonia hydrochlorate.	$C_{20} H_{24} N_2 O$. H Cl.	1.234.		

XLVII. Compounds Containing C. H. and Br.

1st. BROMIDES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[7] Methyl bromide.	C H_3 Br.	1.66443. 0.°	13.°	
[8] Ethyl "	$C_2 H_5$ Br.	1.40.		
[9] " "	"	1.47329, 0.°	40°7.	
[10] " "	"		41.°	
[11] " "	"		38°37.	
[12] " "	"	1.4600, 20.°	40°2.	
[13] " "	"	1.4621, 9.°		
[14] " "	"	1.4685, 13°5.	38°78.	
[15] Propyl "	$C_3 H_7$ Br.	1.353, 16.°	70°5.	
[16] " "	"		68°–72.°	
[17] " "	"	1.388, 0.°	71.°	
[18] " "	"	1.3497, 0.°		
[19] " "	"	1.301, 30°15.	72.°	
[20] " "	"	1.2589, 54°2.		
[21] " "	"	1.3577, 16.°	70°82.	
[22] " " iso:	"	1.320, 13.°	60°–63.°	
[23] " " "	"	1.33, 21.°	60°–62.°	
[24] " " "	"	1.248, 20.°	61°–63.°	
[25] Butyl "	$C_4 H_9$ Br.	1.274, 16.°	89.°	
[26] " "	"	1.305, 0.°		
[27] " "	"	1.2792, 20.°	100°4.	
[28] " "	"	1.2571, 40.°	744 m. m.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Butyl bromide.	$C_4 H_9 Br$.	1.2702, 16.°	92.°	
[2] " "	"	1.249, 0.°		
[3] " "	"	1.191, 40°.2.	90°.5.	
[4] " "	"	1.1408, 73°.5.	760 m. m.	
[5] Amyl "	$C_5 H_{11} Br$.	1.16576, 0.°	118°.7.	
[6] " "	"	1.217, 16.°	121.°	
[7] " "	"	1.2045, 20.°	118°.8.	
[8] " "	"	1.246, 0.°		
[9] " "	"	1.2234, 20.°	128°.7.	
[10] " "	"	1.2044, 40.°	739.4 m. m.	
[11] Octyl "	$C_8 H_{17} Br$.		190.°	
[12] " "	"	1.116, 16.°	198°–200.°	
[13] Cetyl "	$C_{16} H_{33} Br$.			15.°

2d. BROMIDES OF THE ETHYLENE SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Ethylene bromide.	$C_2 H_4 Br_2$.	2.164, 21.°	129°.5.	s.-12° to-15°
[15] " "	"	2.128, 13.°	130.°	
[16] " "	"	2.16292, 20°.09.	132°.6.	
[17] " "	"		130.°	s. 0.°
[18] " "	"		132°.5.	
[19] " "	"	2.179.	131°–132.°	
[20] " "	"	2.1827, 20.°	131°.6.	
[21] " "	"		131°.6.	s. 9°.53.
[22] " " [Compare with brominated ethyl bromide.]	"	2.198, 10.°		
[23] Trimethylene bromide.	$C_3 H_6 Br_2$.	2.0177, 0.°	160°–163.°	
[24] Propylene "	$C_3 H_6 Br_2$.	1.7.	143.°	
[25] " "	"	1.974.	145.°	
[26] " "	"		143°–145.°	
[27] " "	"		140°–144.°	

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[26] Hofmann. A. C. P. 77.
[27] Wurtz. A. C. P. 104. 245.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propylene bromide.	$C_3 H_6 Br_2$.	1.955, 9.°		
[2]	" "	"	1.954, 15.°	140°–143.°	
[3]	" "	"	1.950, 16.°	140°–142.°	
[4]	" "	"	1.943, 17.°	140°5.	
[5]	" "	"	1.972, 0.°	142°65.	
[6]	" "	"	1.946, 17.°		
[7]	" "	"	1.9586, 0.°	141°–143.°	
[8]	" "	"	1.9256, 20.°		
[9]	" "	"	1.9710, 0.°	140°–141.°	
[10]	" "	"	1.9383, 20.°		
[11]	" "	"	1.9463, 17.°	141°61.	
	[Compare with brominated propyl bromide, and methyl bromacetol.]				
[12]	Butylene bromide.	$C_4 H_8 Br_2$.		160.°	
[13]	" "	"		158.°	
[14]	" "	"	1.8299, 0.°	156°–159.°	
[15]	" "	"	1.8119,		
[16]	" "	"	1.876, 0.°	165°5–166.°	
[17]	Hexylene "	$C_6 H_{12} Br_2$.	1.582, 19.°	192°–198.°	

3d. MISCELLANEOUS.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[18]	Bromoform.	C H Br_3.	2.13.		
[19]	"	"	2.9, 12.°	152.°	
[20]	Brominated ethyl bromide.	$C_2 H_4 Br_2$.		110.°	
[21]	" " "	"	2.135, 0.°	110°–112.°	
[22]	" " "	"	2.132.	110°–112.°	
[23]	" " "	"	2.129. 10.°		
[24]	Dibrominated " "	$C_2 H_3 Br_3$.	2.620, 23.°	186°5.	
[25]	" " "	"	2.663, 0.°	186.°	
[26]	" " "	"	2.659, 0.°	187.°	

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[21] Caventou. 14. 608.
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[24] Wurtz. 10. 461.
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[26] Caventou. 14. 608.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Mono-brom-ethylene.	$C_2 H_3 Br$.	a. 1.52.		
[2] Di-brom-ethylene.	$C_2 H_2 Br_2$.	3.038, 10.°		
[3] " " "	"	3.053, 14°5.		
[4] Dibromethylene dibromide.	$C_2 H_2 Br_4$.	2.88, 22.°		
[5] Brominated propyl bromide.	$C_3 H_6 Br_2$.	1.9469, 15.°	141°–142.°	
[6] Brom propylene hydrobromate.	$C_3 H_6 Br_2$.	1.895, 9.°	122.°	
[7] Mono-bromo-propylene.	$C_3 H_5 Br$.	1.400, 13.°	56°–59.°	
[8] " " "	"	1.410, 14.°	56°–58.°	
[9] " " "	"	1.408, 19.°	56°5.	
[10] " " "	"	1.4110, 15.°	57°60.°	
[Compare with allyl bromide.]				
[11] Di-bromo-propylene.	$C_3 H_4 Br_2$.	1.98, 15.°	127°–131.°	
[12] Brominated propylene bromide.	$C_3 H_5 Br_3$.	2.336.	192.°	
[13] " " "	"	2.392, 23.°	195.°	
[14] " " "	"	2.39, 10.°	194°–196.°	
[15] Dibrominated " "	$C_3 H_4 Br_4$.	2.469.	226.°	
[16] Tribrominated " "	$C_3 H_3 Br_5$.	2.601.	255.°	
[17] Mono-bromo-butylene.	$C_4 H_7 Br$.		82°–92.°	
[18] Di-bromo-butylene.	$C_4 H_6 Br_2$.		140°–150.°	
[19] Brominated butylene bromide.	$C_4 H_7 Br_3$.		208°–215.°	
[20] Mono-bromo-amylene.	$C_5 H_9 Br$.	1.22, 19.°	117°–118.°	
[21] Mono-bromo-hexylene.	$C_6 H_{11} Br$.	1.17, 15.°	138.°	
[22] Mono-bromo-decylene.	$C_{10} H_{19} Br$.	1.109, 15.°	215.°	
[23] ——————?	C H Br_2.	2.55.	118.° p. d.	
[24] Methyl bromacetol.	$C_3 H_6 Br_2$.	1.39. (Impure.)	115°–118.°	
[25] "	"	1.8149, 0.°	113°–116.°	
[26] "	"	1.7825, 20.°		
[27] Allyl bromide.	$C_3 H_5 Br$.	1.472.	62.°	
[28] " "	"	1.451, 0.°		
[29] " "	"	1.4385, 15.°	70.° 753 m. m.	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Allyl bromide.	$C_3 H_5 Br$.	1.3609, 62.°		
[2]	" "	"	1. 4507, 0.°	70.°	
[3]	" "	"		70.°	
[4]	" "	"		70°–71.°	
[5]	" "	"	1.461, 0.°	70°–71.°	
[6]	" "	"	1.436, 15.°		
[7]	Allyl tribromide.	$C_3 H_5 Br_3$.	2.436, 23.°	217°–218.°	16.°
[8]	" "	"	2.966, 0.°	a. 240.°	
[9]	" "	"		216°–220.°	
[10]	Allylene bromide.	$C_3 H_4 Br_2$.	1.950.	120.°	
[11]	" "	"	2.05, 0.°	126°–138.°	
[12]	" "	"	2.00, 15.°	130°–131.°	
[13]	" tetrabromide.	$C_3 H_4 Br_4$.	2.94, 0.°	225°–230.°	
[14]	Tribromhydrine.	$C_3 H_5 Br_3$.	2.407, 10.°	219°–220.°	16°–17.°
[15]	Epidibromhydrine.	$C_3 H_4 Br_2$.	2.06, 11.°	151°–152.°	
[16]	Epidibromhydrine bromide.	$C_3 H_4 Br_4$.	2.64.	250°–252.°	
[17]	Conylene bromide.	$C_8 H_{14} Br_2$.	1.5679, 16°25.		
[18]	Dibromo-benzol.	$C_6 H_4 Br_2$.			89.°
[19]	Tetrabromo-benzol.	$C_6 H_2 Br_4$.			137°–140.°
[20]	Benzyl bromide.	$C_7 H_7 Br$.	1.438, 22.°	201°5–202°5.	
[21]	Mono-bromo-toluol.	$C_7 H_7 Br$.	1.4092, 21°5.	179.°	
[22]	" "	"	1.4109, 22.°	185°–185.°5.	
[23]	" "	"	1.4009, 21.°	181°–182.°	
[24]	" "	"		181.°	28°5.
[25]	" "	"	1.3999, 30.°	185.°	28°–29.°
[26]	Dibromo "	$C_7 H_6 Br_2$.	1.8127, 19.°	236.°	
[27]	" "	"	1.812, 19.°	238°–239.°	
[28]	" "	"		239.°	42.° 5.
[29]	" "	"		241.°	60.°
[30]	" "	"	1.812, 22.°	246.°	
[31]	Mono-bromo-xylol.	$C_8 H_9 Br$.	1.335, 21.°	212.°	
[32]	" "	"		203°–204.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Mono-bromo-xylol.	$C_8 H_9 Br$.		207°5.	
[2] Bromo-ethyl benzol.	$C_8 H_9 Br$.	1.34, 13°5.	199.°	
[3] Mono-bromo-cumol.	$C_9 H_{11} Br$.	1.3223, 13.°	218°–220.°	
[4] Mono-bromo-dibenzyl.	$C_{14} H_{13} Br$.	1.318, 9.°	320°+.	s. 0°—.
[5] Bromo-mesitylene.	$C_9 H_{11} Br$.	1.3191, 10.°	225.°	
[6] Mono-bromo-naphthaline	$C_{10} H_7 Br$.	1.555.	285.°	
[7] " " "	"	1.503, 12.°	277.°	

XLVIII. Compounds Containing C. H. Br. O., C. Br. N. O., and C. H. N. Br.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Acetyl bromide.	$C_2 H_3 O Br$.		81.°	
[9] Propionyl "	$C_3 H_5 O Br$.	1,465, 14.°	96°–98.°	
[10] Monobromacetyl bromide	$C_2 H_2 O Br_2$.	2.317, 21°5.	149°–150.°	
[11] Monobromacetic acid.	$C_2 H_3 Br O_2$.		208.°	Below 100?
[12] Dibromacetic "	$C_2 H_2 Br_2 O_2$.	2.25.	225°–230.°	
[13] " "	"		232°–234.°	
[14] Tribromacetic "	$C_2 H Br_3 O_2$.		245.°	130.°
[15] Monobromopropionic acid.	$C_3 H_5 Br O_2$.		190°–210.°	
[16] Dibromopropionic "	$C_3 H_4 Br_2 O_2$.		227.°	65.°
[17] Monobromobutyric "	$C_4 H_7 Br O_2$.	1.54, 15.°	180.°	
[18] Dibromobutyric "	$C_4 H_6 Br_2 O_2$	1.97.		
[19] " "	"		230.° p. d.	45°–48.°
[20] Monobromostearic "	$C_{18} H_{35} Br O_2$.	1.0653, 20.°		41.°
[21] Bromopropionic ether.	$C_5 H_9 Br O_2$.	1.396, 11.°	159°–160.°	
[22] Bromobutyric "	$C_6 H_{11} Br O_2$.	1.33, 15.°	185.° p. d.	
[23] " "	"	1.345, 12.°	175°–178.°	
[24] Deriv. of monobromamylene.	$C_7 H_{13} Br O$.	1.23, 19.°	177°–180.°	
[25] Bromal.	$C_2 H Br_3 O$.	3.34.	100°+.	
[26] "	"		172°–173.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Parabromalide.	C_2 H Br_3 O.	3.107.	200°, p. d.	67.°
[2] Deriv. of Oleic acid.	$C_{18}H_{22}Br_2O_2$.	1.272, 7°5.	200.°	
[3] Epibromhydrin.	C_3H_5 Br O.	1.615, 14.°	138.°	
[4] Dibromhydrin.	$C_3H_6Br_2$ O.	2.11, 10.°	219.°	
[5] "	"	2.11, 18.°	219.°	
[6] Bromophenylic acid.	C_6H_5 Br O.	1.6606, 30.°	132° 22 m. m.	
[7] Bromo isopropyl phenate.	C_9H_{11} Br O.	1.981, 0.°	236.°	
[8] " " "	"	1.957, 12°5.	760 m. m.	
[9] Bromo methyl phenol.	C_7H_7 Br O.	1.494, 9.°	210.°	
[10] Bromopicrin.	C Br_3 N O_2.	2.811, 12°5.		10°25.
[11] Liquid nitrobromtoluol.	C_7H_6 Br N O_2.	1.612, 20.°	269.°	s.—20.°
[12] " " β.	"	1.631, 18.°	255°–256.°	
[13] Solid " α.	"		256°–257.°	43.°

XLIX. Compounds Containing both Chlorine and Bromine.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[14] Ethylene bromochloride.	C_2H_4 Cl Br.	1.700, 18.°	107°–108.°	
[15] Bromethylene hydrochlorate.	C_2H_4 Cl Br.	1.61, 14.°	81°–82.°	
[16] Propylene bromochloride.	C_3H_6 Cl Br.	1.62, 16.°	112°–113.°	
[17] Hexchloro propylene bromide.	$C_3Cl_6Br_2$.	1.974.		
[18] Chloro-acetyl-bromide.	C_2H_2O Cl Br.	1.913, 9.°	127.°	
[19] Bromo-acetyl-chloride.	"	1.908, 9.°	127.°	
[20] Perchlorobromethylic ether.	$C_4Cl_6Br_4$ O.	2.5, 18.°		96.°
[21] Chlorobromhydrin.	C_3H_6 Cl Br O.	1.740, 12.°	197.°	
[22] "	"	1.7641, 9.°	185°–197.°	
[23] Chlorodibromhydrin.	C_3H_5 Cl Br_2.	2.085, 9.°	202°–203.°	
[24] "	"	2.088.	195.°	
[25] "	"	2.004, 15.°	195°–200.°	

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Name.	Formula.	Specific Gravity.	Boiling Point
[1] Derivative of acetone.	$C_3 H_5 Cl Br_2$	2.064, 0.°	170.°
[2] Epichlorobromhydrin.	$C_3 H_4 Cl Br$.	1.69, 14.°	125°-12[illegible]
[3] Epichlorobromhydrin + Br.	$C_3 H_4 Cl Br_3$.	2.39, 14.°	23[illegible]
[4] Epidichlorhydrin + Br.	$C_3 H_4 Cl_2 Br_2$.	2.10, 13.°	2[illegible]
[5] Bromodichlorhydrin of phycite.	$C_3 H_5 Cl_2 Br O$.	2.1719, 0.°	
" "	"	2.1426, 1[illegible]5.	

L. Compounds Containing C. H. and

1st. IODIDES OF THE ETHYL SERIES.

Name.	Formula.	Specific Gravity.	Boiling Point
[7] Methyl iodide.	C H_3 I.	2.237, 22.°	4[illegible]-5[illegible]
[8] " "	"	2.19922, 0.°	43[illegible]8.
[9] " "	"		42[illegible]2.
[10] " "	"	2.2636, 20.°	43[illegible]7.
[11] " "	"	2.269, 25.°	42[illegible]5.
[12] Ethyl "	$C_2 H_5$ I.	1.9206, 23°3.	6[illegible]8.
[13] " "	"	1.92, 16.°	6[illegible]5.
[14] " "	"	1.97546, 0.°	70.
[15] " "	"		71
[16] " "	"	1.9464, 16.°	71
[17] " "	"	1.9309, 15.°	
[18] " "	"	1.98, 4.°	72
[19] " "	"	1.927, 20.°	71
[20] " "	"	1.9265, 19.°	72
[21] " "	"	1.935, 20.°	73
[22] " "	"	1.938, 20.°	72
[23] " "	"	1.979, 0.°	
[24] " "	"	1.907, 30°4.	
[25] " "	"	1.9444, 14°5.	72

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[24] Pi[illegible]
[25] Lin[illegible] 195.

	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Propyl iodide.	$C_3 H_7 I$.	1.789, 16.°	101.°	
[2]	" "	"		99°–101.°	
[3]	" "	"	1.7012, 21.°	101°5.	
[4]	" "	"	1.7343, 16.°	102°–103.°	
[5]	" "	"	1.782, 0.°	102.°	
[6]	" "	"	1.7472. 16.°	102°25.	
[7]	" "	"	1.7377, 23.°	102°11.	
[8]	" "	"	1.7610, 16.°	102°20.	
[9]	" " iso.	"		90°–95.°	
[10]	" " "	"	1.70, 15.°	89°–90.°	
[11]	" " "	"	1.714, 16.°	89.°	
[12]	" " "	"	1.73, 0.°	92°–94.°	
[13]	" " "	"	1.725, 0.°	93.°	
[14]	" " "	"	1.69, 15.°	89°–90.°	
[15]	" " "	"	1.71, 15.°	89°–90.°	
[16]	" " "	"	1.735, 0.°	89.°	
[17]	" " "	"	1.711, 17.°		
[18]	" " "	"	1.71732, 17,° m. of 4.	93.°	
[19]	" " "	"	1.562442,93,°m. of 4.		
[20]	" " "	"	1.70, 18.°	88°–89.°	
[21]	" " "	"	1.715, 15°5.	89°–90.°	
[22]	" " "	"	1.7109, 15.°	88°7–89°5.	
[23]	" "	"	1.7842, 0.°	104°25–104°5.	
[24]	" "	"	1.7674, 9°1.		
[25]	" "	"	1.6843, 52°6.		
[26]	" "	"	1.6373, 75°3.		
[27]	Butyl "	$C_4 H_9 I$.	1.604, 19.°	121.°	
[28]	" "	"	1.632, 0.°	118.°	
[29]	" "	"	1.600, 20.°		
[30]	" "	"	1.584, 30.°		
[31]	" "	"	1.643, 0.°	116°–118.°	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Butyl iodide.	$C_4 H_9 I$.	1.6301, 0.°	121.°	
[2]	" "	"	1.6032, 16.°		
[3]	" "	"	1.54816, 50.°		
[4]	" "	"	1.6263, 0.°	119°–120.°	
[5]	" "	"	1.6111, 10.°		
[6]	" "	"	1.5952, 20.°	758.3 m. m.	
[7]	" "	"	1.5787, 30.°		
[8]	" "	"		130.°	
[9]	" "	"	1.643, 0.°	129°6.	
[10]	" "	"	1.6136, 20.°		
[11]	" "	"	1.5894, 40.°	738.2 m. m.	
[12]	" "	"	1.6345, 0.°	122°5.	
[13]	" "	"	1.6214, 8°3.		
[14]	" "	"	1.6387, 56°4.		
[15]	" "	"	1.464, 98°8.		
[16]	" "	"	1.6081, 19°5.	120°57,	
[17]	" "	"		120°63.	
[18]	Amyl "	$C_5 H_{11} I$.	1.51113, 11°5.	146.°	
[19]	" "	"	1.5277, 0.°		
[20]	" "	"	1.4936, 20.°	149.°	
[21]	" "	"	1.4676, 0.°	147°2–147°7	
[22]	" "	"	1.4387, 22°3.		
[23]	" "	"	1.5087, 15°8.		
[24]	" "	"	1.4734, 20.°	147.°	
[25]	" "	"	1.5435, 0.°	155°4.	
[26]	" "	"	1.5174, 20.°		
[27]	" "	"	1.4961, 40.°	739.3 m. m.	
[28]	Hexyl "	$C_6 H_{13} I$.	1.439.	165.°	
[29]	" "	"	1.431, 19.°	172°–175.°	
[30]	" " β.	"	1.4447, 0.°	167°5.	
[31]	" " "	"	1.3812, 50.°	752 m. m	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Hexyl iodide.	$C_6 H_{13} I.$	1.4115.	179°5.	
[2] Heptyl "	$C_7 H_{15} I.$		196.°	
[3] " "	"		190.°	
[4] " "	"		192.°	
[5] Octyl "	$C_8 H_{17} I.$		193.°	
[6] " "	"	1.310, 16.°	210.°	
[7] " "	"	1.338. 16.°	220°–222.°	
[8] " " iso.	"	1.330, 0.°	120,°	
[9] " " "	"	1.314, 21.°	in vacuo.	
[10] Cetyl "	$C_{16} H_{33} I.$			22.°
[11] Melissyl "	$C_{30} H_{61} I.$			67.°

2d. MISCELLANEOUS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[12] Methylene iodide.	$C H_2 I_2.$	3.342, 5.°	181,° p. d.	5,° rs. 3.°
[13] Ethylene "	$C_2 H_4 I_2.$			73.°
[14] " "	"	2.07.		70.°
[15] Propylene "	$C_3 H_6 I_2.$	2.490, 18°5.		
[16] Allyl "	$C_3 H_5 I.$	1.789, 16.°	101.°	
[17] " "	"	1.746, 0.°	89°–92.°	
[18] " "	"	1.848, 12.°	101°5–102.°	
[19] " "	"	1.839, 14.°	101°–102.°	
[20] " "	"		97°–100.°	
[21] Allylene "	$C_3 H_4 I_2.$	2.62, 0.°	198.°	
[22] Moniodo-allylene.	$C_3 H_3 I.$	1.7.	98.°	
[23] Diallyl monohydriodate.	$C_6 H_{11} I.$	1.497, 0.°	164°–165.°	
[24] " dihydriodate.	$C_6 H_{12} I_2.$	2.024, 0.°		
[25] Allylene monohydriodate.	$C_3 H_5 I.$	1.8346, 0.°	82.°	
[26] " "	"	1.8028, 16.°		
[27] " dihydriodate.	$C_3 H_6 I_2.$	2.15, 0.°		

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[25] Semenoff. 18. 494.
[26] Compare with allyl iodide.
[27] Oppenheim. 18. 493.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Allylene dihydriodate.	$C_3 H_6 I_2$.	2.4458, 0.°	147°–148.°	
[2] Ethyl vinyl hydriodate.	$C_4 H_9 I$.	1.634, 0.°	120°–121.°	
[3] Ethyl allyl "	$C_5 H_{11} I$.	1.537, 0.°	146.°	
[4] " " "	"	1.5219, 11.°	763 m. m.	
[5] Vinyl iodide.	$C_2 H_3 I$.	1.98.°		
[6] Iodoform.	$C H I_3$.	2.00.		115°–120.°
[7] Moniodobenzol.	$C_6 H_5 I$.	1.69.	185°–190.	
[8] "	"	1.833.	188°2.	
[9] "	"	1.64, 15.°	185.°	
[10] Iodotoluol. Ortho.	$C_7 H_7 I$.	1.698, 20.°	204.°	
[11] " Meta.	"	1.697, 20.°	205.°	
[12] Benzyl iodide.	$C_7 H_7 I$.	1.7335, 25.° l.	a. 240.°	24°1.

LI. Compounds Containing C, H, O, and I.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Acetyl iodide.	$C_2 H_3 O. I.$	1.98, 17.°	108.°	
[14] " "	"		104°–105.°	
[15] Propionyl iodide.	$C_3 H_5 O. I.$		127°–128.°	
[16] Butyryl "	$C_4 H_7 O. I.$		146°–148.°	
[17] Valeryl "	$C_5 H_9 O. I.$		168.°	
[18] Biniodated methyl oxide	$C_2 H_2 I_4 O.$	3.345.	181°–182.°	s.—6.°
[19] Iodhydrin.	$C_6 H_{11} I O_3$.	1.783.		
[20] Epi iodhydrin.	$C_3 H_5 I O.$	2.03, 13.°	160°–180.°	

LII. Compounds Containing both Chlorine and Iodine, or Bromine and Iodine.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[21] Ethylene chloriodide.	$C_2 H_4 Cl I$.	2.151, 0.°	145.°	
[22] " "	"	2.39, 20.°	146.°	
[23] Propylene "	$C_3 H_6 Cl I$.	1.932, 0.°		
[24] " "	"	1.824.		

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[2] Wurtz. A. C. P. 152. 23.
[3] Wurtz. 21. 446.
[4] Compare with amyl iodide.
[5] Regnault. [stellung."
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[7] Schutzenberger. 14. 348.
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[17] Cahours. 10. 344.
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[19] Berthelot & De Luca. 7. 454.
[20] Reboul. 13. 459.
[21] Simpson. 16. 485.
[22] Maumené. 22. 345.
[23] Simpson. 16. 494.
[24] Oppenheim. 20. 571.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloriodoform.	C H Cl_2 I.	1.96.		
[2] "	"	2.454, 0.°		
[3] "	"	2.403, 21°5.		
[4] Chloriodotoluol.	C_7 H_6 Cl I.	1.702, 19.°	240.°	
[5] " Alpha.	"	1.716, 17.°	242°–243.°	
[6] " Beta.	"	1.770, 19°5.	240.°	10.°
[7] Iodochlorhydrin.	C_6 H_6 Cl I O_2.	2.06, 10.°	226.°	
[8] Ethylene bromiodide.	C_2 H_4 Br I.	2.7, 1.°	160,° p. d.	
[9] Bromethylene hydriodate	C_2 H_4 Br I.	2.5, 1.°	141°–142.°	
[10] Brompropylene "	C_3 H_6 Br I.	2.2, 11.°	148,° p. d.	
[11] Para-iodorthobromtoluol.	C_7 H_6 Br I.	2.044, 20.7.°	265.°	
[12] Meta-iodorthobromtoluol.	"	2.139, 18.°	260.°	

LIII. Organic Compounds Containing Sulphur.

1st. COMPOUNDS CONTAINING C, H, and S.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Methyl sulphide.	C_2 H_6 S.	.845, 21.°	41.°	
[14] Methyl ethyl sulphide.	C_3 H_8 S.		58°8–59°5.	
[15] Ethyl "	C_4 H_{10} S.	.825, 20.°	73.°	
[16] " "	"	.83672, 0.°	91.°	
[17] " "	"		81.°	
[18] Isopropyl "	C_6 H_{14} S.		105.°	
[19] Ethyl amyl "	C_7 H_{16} S.		132°–133°5.	
[20] " " "	"	.852, 0.°	158°–159.°	
[21] Butyl "	C_8 H_{18} S.	.849. 0.°	176 –185.°	
[22] Amyl "	C_{10} H_{22} S.		216.°	
[23] Hexyl "	C_{12} H_{26} S.		230.°	
[24] Cetyl "	C_{32} H_{66} S.			57°5. s. 54.°
[25] Methyl disulphide.	C_2 H_6 S_2.	1.046, 18.°	116°–118.°	
[26] " "	"	1.06358, 0.°	112°1.	

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[25] Cahours. A. C. Phys. (3). 18. 258.
[26] Pierre. 15.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
Allylene dihydriodate.	$C_3H_4I_2$	2.4458. 1°	147°—148°	
Ethyl vinyl dihydriodate.	$C_4H_8I_2$	2.0324. 1°	220°—221°	
[1] Ethyl allyl "	$C_5H_{10}I_2$	1.837. 1°	216°	
[2] " " "	"	1.8219. 11.3°	93 m. m.	
[3] Vinyl iodide.	C_2H_3I	1.98.[3]		
[4] Iodoform	CHI_3	4.008.		115°—120°
[5] Monoiodobenzol.	C_6H_5I	1.69.	185°—190.	
[6] "	"	1.833.	188°.	
[7] "	"	1.814. 15°.	185°.	
[8] Iodotoluol. Ortho.	C_7H_7I	1.698. 20°.	204°.	
[9] " Meta.	"	1.697. 20°.	205°.	
[10] Benzyl iodide.	C_7H_7I	1.7355. 25°.	c. 210°.	24°.

LI. Compounds Containing C, H, O, and I.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[11] Acetyl iodide.	C_2H_3OI	1.98. 17°.	108°.	
[12] " "	"		104°—105°.	
[13] Propionyl iodide.	C_3H_5OI		127°—128°.	
[14] Butyryl "	C_4H_7OI		146°—148°.	
[15] Valeryl "	C_5H_9OI		168°.	
[16] Bromiodated methyl oxide.	$C_2H_2I_2O$	3.345.	81°—82°.	4—5°.
[17] Isothymen	$C_{10}H_{12}I_2$	1.83.		
[18] Bromethylen.	$C_{10}H_{12}I_2$	2.05. 15°.	165°—170°.	

LII. Compounds Containing both Chlorine and Iodine, or Bromine and Iodine.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[19] Ethylene chloriodide.	C_2H_4ClI	2.131. 0°.	143°.	
[20] " "	"	2.39. 20°.	146°.	
[21] Propylene "	C_3H_6ClI	1.932. 0°.		
[22] " "	"	1.824.		

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[4] Compare with amyl iodide.
[5] Regnault. (melting.)
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[10] Beilstein & Kuhlberg. A. C. P. 159. 349.
[11] Beilstein & Kuhlberg. Z. P. C. 13. 109.
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[17] Cahours. 10. 344.
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[20] Reboul. 13. 459.
[21] Simpson. 16. 485.
[22] Manmené. 22. 345.
[23] Simpson. 16. 494.
[24] Oppenheim. 20. 571.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Chloriodoform.	C H Cl_2 I.	1.96.		
[2] "	"	2.454, 0.°		
[3] "	"	2.403, 21°.5.		
[4] Chloriodotoluol.	C_7 H_6 Cl I.	1.702, 19.°	240.°	
[5] " Alpha.	"	1.716, 17.°	242°–243.°	
[6] " Beta.	"	1.770, 19°.5.	240.°	10.°
[7] Iodochlorhydrin.	C_6 H_6 Cl I O_2.	2.06, 10.°	226.°	
[8] Ethylene bromiodide.	C_2 H_4 Br I.	2.7, 1.°	160.° p. d.	
[9] Bromethylene hydriodate	C_2 H_4 Br I.	2.5, 1.°	141°–142.°	
[10] Brompropylene "	C_3 H_6 Br I.	2.2, 11.°	148.° p. d.	
[11] Para-iodorthobromtoluol.	C_7 H_6 Br I.	2.044, 20.7.°	265.°	
[12] Meta-iodorthobromtoluol.	"	2.139, 18.°	260.°	

LIII. Organic Compounds Containing Sulphur.

1st. COMPOUNDS CONTAINING C, H, and S.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[13] Methyl sulphide.	C_2 H_6 S.	.845, 21.°	41.°	
[14] Methyl ethyl sulphide.	C_3 H_8 S.		58°.8–59°.5.	
[15] Ethyl "	C_4 H_{10} S.	.825, 20.°	73.°	
[16] " "	"	.83672, 0.°	91.°	
[17] " "	"		81.°	
[18] Isopropyl "	C_6 H_{14} S.		105.°	
[19] Ethyl amyl "	C_7 H_{16} S.		132°–133°.5.	
[20] " " " .	"	.852, 0.°	158°–159.°	
[21] Butyl "	C_8 H_{18} S.	.849. 0.°	176 –185.°	
[22] Amyl "	C_{10} H_{22} S.		216.°	
[23] Hexyl "	C_{12} H_{26} S.		230.°	
[24] Cetyl "	C_{32} H_{66} S.			57°.5. s. 54.°
[25] Methyl disulphide.	C_2 H_6 S_2.	1.046, 18.°	116°–118.°	
[26] " "	"	1.06358, 0.°	112°.1.	

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[1] Bouchardat. A. C. P. 22. 230.
[2] [3] Borodine. 15. 391.
[4] Beilstein & Kuhlberg. A. C. P. 156. 82.
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Deriv. of œnanthol.	$C_{14} H_{28} S O$.	.875, 23.°		
[2] Glycerin monosulphydrate.	$C_3 H_8 S O_2$.	1.295, 14°.4.		
[3] " disulphydrate	$C_3 H_8 S_2 O$.	1.342, 14°.4.		
[4] Xanthurin.	$C_4 H_8 S O_2$.	1.012.	145.°	
[5] Carbonyl disulpho diethyl.	$C_5 H_{10} S_2 O$.	1.084, 20.°	196°–197.°	

3d. SULPHUR COMPOUNDS CONTAINING NITROGEN.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[6] Methyl sulphocyanide.	$C_2 H_3 N S$.	1.115, 16.°	132°–133.°	
[7] " "	"	1.08794, 0.°	132°.86.	
[8] Ethyl "	$C_3 H_5 N S$.	1.020, 16.°	146.°	
[9] " "	"	a. 1.00, 15.°		
[10] " "	"	1.033, 0.°		
[11] " "	"	1.0126, 19.°		
[12] " "	"	1.0024, 23.°	146.°	
[13] " "	"	.8694. } 146.°		
[14] " "	"	.87014. }		
[15] Isopropyl "	$C_4 H_7 N S$.	.963, 20.°	149°–151.°	
[16] Amyl "	$C_6 H_{11} N S$.		197.°	
[17] " "	"	.905, 20.°	195°–210.°	
[18] Hexyl "	$C_7 H_{13} N S$.	.922, 12.°	215°–220.°	
[19] Allyl "	$C_4 H_5 N S$.	1.015, 20.°	143.°	
[20] " "	"	1.009, } 15.°	148.°	
[21] " "	"	1.010, }		
[22] " "	"	1.0282, 0.°	150°.4–150°.7	
[23] " "	"	1.0173, 10°.1.		
[24] Phenyl "	$C_7 H_5 N S$.	1.135, 15°.5.	222.°	
[25] Amylene bithiocyanide.	$C_5 H_{10} S Cy$.	1.07, 13.°		
[26] Amylene bithio bithiocyanide.	$C_5 H_{10} S_2 Cy$.	1.16, 13.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sulphocyanacetic ether.	$C_5 H_7 N S O_2$.	1.174.	a. 220° p.d.	
[2] Thialdine.	$C_6 H_{13} N S_2$.	1.191, 18.°		43,° s. 42.°
[3] Œnanthothialdine.	$C_{21} H_{43} N S_2$.	.896, 24.°		
[4] Cystic oxide.	$C_3 H_7 N S O_2$.	1.7143.		

4th. CHLORINATED SULPHUR COMPOUNDS.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[5] Chlorosulphuric ether.	$C_2 H_5 Cl S O_3$.	1.379, 0.°		
[6] " "	"	1.3556, 27.°	80°–82.°	
[7] " "	"	1.324, 61.°		
[8] Tetrachlorethylic sulphide.	$C_4 H_6 Cl_4 S$.	1.547, 12.°	167°–172.°	
[9] Octochlorethylic "	$C_4 H_2 Cl_8 S$.	1.673, 24.°	160.° p. d.	
[10] Trichlormethylamyl sulphite.	$C_6 H_{11} Cl_3 S O_3$.	1.104.		
[11] Ethylene bisulphochloride.	$C_2 H_4 S Cl$.	1.346, 19.°		
[12] Amylene "	$C_5 H_{10} S Cl$.	1.149, 12.°		
[13] Chlorethylene "	$C_2 H_3 S Cl_2$.	1.599, 11.°		
[14] Ethylene bichlorosulphide.	$C_2 H_4 S Cl_2$.	1.408, 13.°		
[15] Amylene "	$C_5 H_{10} S Cl_2$.	1.138, 14.°		
[16] Bichlorethylene chlorosulphide.	$C_4 H_4 S Cl_6$.	1.225, 13°5.		
[17] " "	"	1.219, 13°5.		
[18] Terchloramylene "	$C_{10} H_{14} S Cl_8$.	1.406, 16.°		
[19] Ethyl sulphurous chloride.	$C_2 H_5 Cl S O_2$.	1.357, 22°5.	171.°	
[20] Phenyl " "	$C_6 H_5 Cl S O_2$.	1.378, 23.°	254.°	

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LIV. Organic Compounds of Selenium and Tellurium.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethyl selenide.	$C_4 H_{10} Se$.		107°–108.°	
[2] " diselenide.	$C_4 H_{10} Se_2$.		186.°	
[3] Methyl telluride.	$C_2 H_6 Te$.		82.°	
[4] Ethyl "	$C_4 H_{10} Te$.		Below 100.°	
[5] Amyl "	$C_{10} H_{22} Te$.		198.°	
[6] Tellurmethyl chloride.	$C_2 H_6 Te. Cl_2$.			97°5.
[7] " bromide.	$C_2 H_6 Te. Br_2$.			89.°

LV. Organic Compounds Containing Phosphorus.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Ethyl phosphite.	$C_6 H_{15} P O_3$.	1.075.	191.°	
[9] Amyl "	$C_{15} H_{33} P O_3$.		236.°	
[10] Ethyl phosphate.	$C_6 H_{15} P O_4$.	1.072, 12.°	215.°	
[11] " pyrophosphate.	$C_8 H_{20} P_2 O_7$.	1.172, 17.°		
[12] Amyl amylphosphite.	$C_{15} H_{33} P O_3$.	.967, 19°5.		
[13] Diamyl phosphoric acid.	$C_{10} H_{23} P O_4$.	1.025, 20.°		
[14] Amylnitrophosphorous acid.	$C_{10} H_{23} P NO_4$.	1.02, 20.°)		
[15] " " "		1.00, 70.)		
[16] Amylsulphoxyphosphoric ether.	$C_{15} H_{33} P S O_3$.	.849, 12.°		
[17] Triphenyl trisulphophosphamide.	$C_{18} H_{18} N_3 P S_3$.	1.34.		78.°
[18] Ethyl phosphite chloride	$C_2 H_5 P O Cl_2$.	1.316, 0.°	117.°	
[19] Butyl " "	$C_4 H_9 P O Cl_2$.	1.191, 0.°	154°–156.°	
[20] Amyl " "	$C_5 H_{11} P O Cl_2$.	1.109, 0.°	175.°	
[21] Monomethyl phosphin.	$C H_5 P$.		—64.°	
[22] Dimethyl "	$C_2 H_7 P$.		25.°	
[23] Trimethyl "	$C_3 H_9 P$.		40°–42.°	
[24] Monethyl "	$C_2 H_7 P$.		25.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Diethyl phosphin.	$C_4 H_{11} P$.		85.°	
[2] Triethyl "	$C_6 H_{15} P$.	.812, 15°5.	127°5.	
[3] " "	"		128.°	
[4] Triethyl phosphin oxide.	$C_6 H_{15} P O$.		240.°	44.°
[5] " " "	"			52°9, s. 42.°
[6] " " "	"		242°8–243.°	Cryst. 51°9.
[7] " " sulphide.	$C_6 H_{15} P S$.			94,° s. 88.°
[8] " " selenide.	$C_6 H_{15} P Se$.			112.°

LVI. Organic Compounds Containing Boron.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[9] Trimethyl borate.	$C_3 H_9 B O_3$.	.9551, 0.°	72.°	
[10] " "	"	.940, 0.°	65.°	
[11] " "	"	.915, 20.°		
[12] Triethyl "	$C_6 H_{15} B O_3$.	.8849.	119.°	
[13] " "	"	.871.	121.°	
[14] " "	"	.887, 0.°	120.°	
[15] " "	"	.861, 26°5.		
[16] Triamyl "	$C_{15} H_{33} B O_3$.	.870.	270°–275.°	
[17] " "	"	.872, 0.°	254.°	
[18] " "	"	.852, 24.°		
[19] " "	"	.840–855, 28.°		
[20] " "	"	853, 29.°		
[21] Methyl diethyl borate.	$C_5 H_{13} B O_3$.	.904, 0.°	100°–105.°	
[22] " " "	"	.883, 20.°		
[23] Ethyl diamyl "	$C_{12} H_{27} B O_3$.	.876, 0.°	210°–215.°	
[24] " " "	"	.852, 28.°		
[25] Amyl diethyl "	$C_9 H_{21} B O_3$.	858, 26.°	173°–175.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Monamyl borate.	$C_5 H_{11} B O_2$.	.971, 0.°		
[2] " "	"	.949, 20.°		
[3] Monocetyl "	$C_{16} H_{33} B O_2$.			58.°
[4] Tetraphenyl diborate.	$C_{24} H_{20} B_2 O_5$.	1.13.°		
[5] " "	"	1.124, 0.°		
[6] " "	"	1.106, 20.°		
[7] Boron triethyl.	$C_6 H_{15} B$.	.6961, 23.°	95°–97.°	

LVII. Organic Compounds Containing Silicon.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[8] Diethyl silicate.	$C_4 H_{10} Si O_3$.	1.079, 24.°	350.°	
[9] Tetramethyl silicate.	$C_4 H_{12} Si O_4$.	1.0589, 0.°	120°–122.°	
[10] Trimethyl ethyl silicate.	$C_5 H_{14} Si O_4$.	1.023.	133°–135.°	
[11] Dimethyl diethyl "	$C_6 H_{16} Si O_4$.	1.004, 0.°	143°–146.°	
[12] Methyl triethyl "	$C_7 H_{18} Si O_4$.	.989, 0.°	155°–157.°	
[13] Tetrethyl "	$C_8 H_{20} Si O_4$.	.932.	162°–163.°	
[14] " "	"	.933, 20.°		
[15] " "	"	.9676, 0.°	165°5.	
[16] Triethyl amyl "	$C_{11} H_{26} Si O_4$.	.926, 0.°	216°–225.°	
[17] Dimethyl diamyl "	$C_{12} H_{28} Si O_4$.		225°–235.°	
[18] Diethyl " "	$C_{14} H_{32} Si O_4$.	.915, 0.°	245°–250.°	
[19] Ethyl triamyl "	$C_{17} H_{38} Si O_4$.	.913, 0.°	280°–285.°	
[20] Tetramyl "	$C_{20} H_{44} Si O_4$.	.868, 20.°	322–325.°	
[21] Hexmethyl disilicate.	$C_6 H_{18} Si_2 O_7$.	1.1441, 0.°	201°–202°5.	
[22] Hexethyl "	$C_{12} H_{30} Si_2 O_7$.	1.0196, 0.°	233°–238.°	
[23] " "	"	1.0019, 19°2.		
[24] Tribasic silicopropionic ether.	$Si C_8 H_{20} O_3$.	.9207, 9.°	159°–162.°	
[25] Orthosilicopropionic "	$Si_3 C_6 H_{20} O_3$.	.9207, 0.°	158°5.	
[26] Silicon tetramethyl.	$C_4 H_{12} Si$.		30°–31.°	
[27] " tetrethyl.	$C_8 H_{20} Si$.	.7657, 22°7.	152°5.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Silicon tetrethyl.	$C_8 H_{20} Si$.	.8341, 0.°		
[2] Methyl silicic monochlorhydrin.	$Si C_3 H_9 Cl O_3$.	1.1954, 0.°	114°5–115°5.	
[3] " " dichlorhydrin.	$Si C_2 H_6 Cl_2 O_2$.	1.2595.	98°–103.°	
[4] " " trichlorhydrin.	$Si C H_3 Cl_3 O$.		82°–86.°	
[5] Ethyl silicic monochlorhydrin.	$Si C_6 H_{15} Cl O_3$.	1.0483, 0.°	155°–157.°	
[6] " " dichlorhydrin.	$Si C_4 H_{10} Cl_2 O_2$.	1.144, 0.°	136°–138.°	
[7] " " trichlorhydrin.	$Si C_2 H_5 Cl_3 O$.	1.241, 0.°	104.°	
[8] Silicon iodoform.	$Si H I_3$.	3.362, 0.°	220.°	
[9] " "	"	3.314, 20.°		

LVIII. Organic Compounds of Tl, Pb, Zn, Hg, and Al.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[10] Thallic ethylate.	$C_2 H_5 Tl O$.	3.480 to 3.685.		
[11] " amylate.	$C_5 H_{11} Tl O$.	2.465 to 2.518.		
[12] Lead tetramethyl.	$(C H_3)_4$. Pb.	2.034, 0.°		
[13] " diethyl.	$(C_2 H_5)_2$. Pb.	1.55.	198°–202.°	
[14] " "	"	1.62.		
[15] " triethyl.	$(C_2 H_5)_3$. Pb.	1.471, 10.°		
[16] Zinc methyl.	$(C H_3)_2$. Zn.	1.386, 10°5.	46.°	
[17] " ethyl.	$(C_2 H_5)_2$. Zn.	1.182, 18.°	118.°	
[18] " amyl.	$(C_5 H_{11})_2$. Zn.	1.022, 0.°	220.°	
[19] Mercury methyl.	$(C H_3)_2$. Hg.	3.069.	93°–96.°	
[20] " ethyl.	$(C_2 H_5)_2$. Hg.	2.444.	158°–160.°	
[21] " "	"		159.°	
[22] " butyl.	$(C_4 H_9)_2$. Hg.	1.7469, 0.°		
[23] " "	"	1.7192, 16.°		
[24] " amyl.	$(C_5 H_{11})_2$. Hg.	1.6663, 0.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] β Hexyl mercaptide of mercury.	$C_{12} H_{26} S_2 Hg$.	1.6502, 0.°		
[2] Mercuric iodomethide.	$C H_3 I Hg$.			143.°
[3] " chloramylide.	$C_5 H_{11} Cl Hg$.			86.°
[4] " iodamylide.	$C_5 H_{11} I Hg$.			122.°
[5] Aluminum methyl.	$(C H_3)_3 Al$.		130.°	s. 0°+.
[6] " ethyl.	$(C_2 H_5)_3 Al$.		194.°	

LIX. Organic Compounds Containing As, Sb, or Bi.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[7] Methyl arsenite.		1.428, 9°6.	128°–129.°	
[8] Ethyl "		1.224, 0.°	166°–168.°	
[9] Amyl "		1.0525, 0.°	288.°	
[10] Methyl arsenate.		1.5591, 14°5.	213°–215.°	
[11] Ethyl "		1.3264, 0.°		
[12] " "		1.3161, 8°8.		
[13] Arsen-dimethyl.	$(C H_3)_2$. As.		170.°	s. 6.°
[14] Arsen-diethyl.	$(C_2 H_5)_2$. As.		185°–190.°	
[15] Arsen-triethyl.	$(C_2 H_5)_3$. As.	1.151, 16°7.	140°–180.°	
[16] Arsenmethyl chloride.	$C H_3 As Cl_2$.		133.°	
[17] " iodide.	$C H_3 As I_2$.			25.°
[18] " oxide.	$C H_3 As O$.			95.°
[19] " sulphide.	$C H_3 As S$.			a. 110.°
[20] Alkarsine.	$C_2 H_6 As O$.(?)	1.462, 15.°		
[21] Stib-trimethyl.	$(C H_3)_3$. Sb.	1.523, 15.°	80°6.	
[22] Stib-triethyl.	$(C_2 H_5)_3$. Sb.	1.3244, 16.°	158°5.	
[23] Stib-triamyl.	$(C_5 H_{11})_3$. Sb.	1.1333, 17.°		
[24] " "	"	1.0587.		
[25] Stib-triethyl chloride.	$C_6 H_{15} Sb Cl_2$.	1.540, 17.°		
[26] " " bromide.	$C_6 H_{15} Sb Br_2$.	1.953, 17.°		s.—10.°
[27] " " iodide.	$C_6 H_{15} Sb I_2$.			70°5.
[28] Bismuth-triethyl.	$(C_2 H_5)_3$. Bi.	1.82.		

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LX. Organic Compounds of Tin.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Stann-tetramethyl.	$(C H_3)_4$. Sn.		140°–145.°	
[2] " "	"	1.3138, 0.°	78.°	
[3] Stann-diethyl.	$(C_2 H_5)_2$. Sn.	1.558, 15.°		
[4] " "	"	1.192.	176°–180.°	
[5] Stann-triethyl.	$(C_2 H_5)_6$. Sn_2.	1.4115, 0.°	268°–272.°	
[6] Stann-tetrethyl.	$(C_2 H_5)_4$. Sn.		180.°	
[7] " "	"	1.187, 13°6.	181.°	
[8] Stann-dimethyl-diethyl.	$(CH_3)_2(C_2H_5)_2$.Sn	1.2319, 19.°	144°–146.°	
[9] " " "	"	1.2603, 0.°		
[10] " " "	"	1.2509, 0.°		
[11] Stann-ethyl-trimethyl.	$(C H_3)_3 C_2 H_5$. Sn.	1.243.	125°–128.°	
[12] Stann-methyl-triethyl.	$C H_3 (C_2 H_5)_3$. Sn.		162°–163.°	
[13] Ethylene-stannethyl.	$(C_2 H_5)_4$. Sn_2.	1.410.		
[14] Stann-triethyl-phenyl.	$(C_2 H_5)_3 C_6 H_5$. Sn.	1.2639, 0.°	254.°	
[15] Stann-triethyl ethylate.	$C_8 H_{20}$ Sn O.	1.2634, 0.°	269°–273.°	43.°
[16] Stann-dimethyl chloride.	$C_2 H_6$ Sn Cl_2.		188°–190.°	90.°
[17] " " bromide.	$C_2 H_6$ Sn Br_2.		208°–210.°	
[18] " " iodide.	$C_2 H_6$ Sn I_2.	2.872, 22.°	228.°	30.°
[19] Stann-trimethyl iodide.	$C_3 H_9$ Sn I.	2.155, 18.°	188°–190.°	
[20] " " "	"	2.1432, 0.°	170.°	
[21] " " "	"	2.1096, 18.°		
[22] Stann-diethyl chloride.	$C_4 H_{10}$ Sn Cl_2.		220.°	60.°
[23] " " "	"			85.°
[24] " " bromide.	$C_4 H_{10}$ Sn Br_2.		232°–233.°	
[25] " " iodide.	$C_4 H_{10}$ Sn I_2.		245°–246.°	42.°
[26] " " "	"	1.8.		
[27] " " "	"	2.0329, 15.°	Begins, 208°	
[28] " " "	"			45.°
[29] Stann-triethyl chloride.	$C_6 H_{15}$ Sn Cl.	1.428, 8.°	208°–210.°	
[30] " " "	"	1.320.		
[31] " " bromide.	$C_6 H_{15}$ Sn Br.	1.630.		

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[30] Löwig. 5. 588.
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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Stann-triethyl bromide.	$C_6 H_{15} Sn Br$.		222°–224.°	
[2] " " iodide.	$C_6 H_{15} Sn I$.	1.850.	180°–200.°	
[3] " " "	"	1.833, 22.°	235°–238.°	
[4] Ethstannethyl chloride.	$C_{10} H_{25} Sn_2 Cl$.	1.30.		
[5] " bromide.	$C_{10} H_{25} Sn_2 Br$.	1.48.		
[6] " iodide.	$C_{10} H_{25} Sn_2 I$.	1.724.		

LXI. Miscellaneous Organic Compounds.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[7] Cane sugar + Na I.	$\left\{ \begin{matrix} (C_{12} H_{22} O_{11})_2 \\ (Na\ I)_3 . 3aq. \end{matrix} \right\}$	1.854.		
[8] " " "				
[9] Grape sugar + Na Cl.	$\left\{ \begin{matrix} (C_6 H_{12} O_6)_2 . \\ Na\ Cl . H_2 O. \end{matrix} \right\}$	1.55–1.59, 11.°		
[10] " " "				
[11] Triethyl phosphin + Pt Cl_2.	$(C_6 H_{15} P)_2 . Pt Cl_2$.	1.5, 10.°		150.°

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SUPPLEMENT TO THE FOREGOING TABLES.

CONTAINING DETERMINATIONS ACCIDENTALLY OMITTED, AND OTHERS PUBLISHED SINCE THE PREVIOUS PORTIONS OF THE WORK WERE COMPLETED.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Iron. Pure. Melted in H.	Fe.	7.880, 16.°		
[2] " Ditto, hammered.	"	7.868, 16.°		
[3] " " wire drawn.	"	7.847, 16.°		
[4] " Pure. Fused in crucible.	"	7.833, 16.°		
[5] Copper. Hammered.	Cu.	8.855.		
[6] " "	"	8.878.		
[7] " Rolled.	"	8.879.		
[8] " "	"	8.898.		
[9] " Annealed.	"	8.884.		
[10] " "	"	8.896.		
[11] Ammonium silicofluoride.	$2\,Am\,F.\,Si\,F_4$.	1.970.		
[12] Ammonium stannofluoride.	$2\,Am\,F.\,Sn\,F_4$.	2.887.		
[13] Potassium zircofluoride.	$2\,K\,F.\,Zr\,F_4$.	3.582.		
[14] " tantalofluoride.	$2\,K\,F.\,Ta\,F_5$.	4.056.		
[15] Lithium silicofluoride.	$2\,Li\,F.\,Si\,F_4.\,2\,H_2O$.	2.244.		
[16] Potassium titanofluoride	$2\,K\,F.\,Ti\,F_4.\,H_2O$.	2.992.		
[17] " niobofluoride.	$2\,K\,F.\,Nb\,O\,F_3.\,H_2O$.	2.813.		
[18] Ammonium palladiochloride.	$2\,Am\,Cl.\,Pd\,Cl_4$.	3.065.		
[19] Potassium "	$2\,K\,Cl.\,Pd\,Cl_4$.	2.739.		
[20] Magnesium platinchloride.	$Mg\,Cl_2.\,Pt\,Cl_4.\,12\,H_2O$.	2.060.		
[21] Tricyanogen trichloride.	$Cy_3\,Cl_3$.	1.32.		
[22] Chloronitric acid.		1.3677, 8.°	—7°2.	
[23] Matlockite.	$Pb\,Cl_2.\,Pb\,O$.	7.21.		
[24] Mendipite.	$Pb\,Cl_2.\,2\,Pb\,O$.	7.0–7.1.		
[25] Cadmium ammoniochloride.	$Cd\,Cl_2.\,2\,N\,H_3$.	2632.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Potassium stannobromide.	$2\,K\,Br.\,Sn\,Br_4$.	3.783.		
[2]	Barium platinbromide.	$Ba\,Br_2.Pt\,Br_4.10\,H_2O$	3.713.		
[3]	Bromonitric acid.	$N\,O\,Br_3$.	2.628, 22°6.		
[4]	Phosphorus sulphobromide.	$P_2\,S_3\,Br_4$.	2.2621, 17.°		
[5]	Carbon bromochloride.	$C\,Cl_3\,Br$.	2.058, 0.°	104°3.	
[6]	" "	"	2.017, 19°5.		
[7]	" "	"	1.842, 100.°		
[8]	Selenium moniodide.	Se I.			70.°
[9]	" tetriodide.	$Se\,I_4$.			75°–80°
[10]	Cyanogen iodide.	Cy I.	1.85+		
[11]	Magnesium platiniodide.	$Mg\,I_2.\,Pt\,I_4.\,9\,H_2\,O$.	3.458.		
[12]	Schwartzembergite.	$Pb\,I_2.\,2\,Pb\,O$.	6.3.		
[13]	"	"	5.7.		
[14]	Nickel ammonioiodide.	$Ni\,I_2.\,6\,N\,H_3$.	2.101.		
[15]	Iodine pentoxide.	$I_2\,O_5$.	5.037, 0.°		
[16]	" "	"	5.020, 51.°		
[17]	Chromium trioxide.	$Cr\,O_3$.	2.775. Extremes of six.		
[18]	" "	"	2.804.		
[19]	Yttrium monoxide.	Y O.	5.03.		
[20]	Erbium "	Er O.	8.8–8.9.		
[21]	Quartz. Amethyst.	$Si\,O_2$.	2.744.		
[22]	" "	"	2.659.		
[23]	" Smoky.	"	2.651.		
[24]	" "	"	2.658.		
[25]	" Rose.	"	2.651.		
[26]	" "	"	2.653.		
[27]	" "	"	2.658.		
[28]	" Milky.	"	2.618.		

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[27] Breithaupt. Schweig. J. 68. 441.
[28] Breithaupt. Schweig. J. 68. 441.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Selenium sulphide.	Se S.	3.056, 0.°		
[2] " "	"	3.035, 52.°		
[3] Bismuth nickel sulphide.	Bi_{24} Ni_5 S_2.	9.15.		
[4] Silver chlorate.	Ag Cl O_3.	4.439.		
[5] Lead "	Pb $(Cl_2 O_3)_2$. H_2 O.	3.989.		
[6] Mercury "	Hg_2 Cl_2 O_7. H_2 O.	5.151.		
[7] Potassium bromate.	K Br O_3.	3.218.		
[8] Magnesium "	Mg $(Br O_3)_2$. 6 H_2 O.	2.289.		
[9] Cadmium "	Cd $(Br O_3)_2$. 2 H_2 O.	3.758.		
[10]	K_2 S_2 O_6.	2.277.		
[11]	Na_2 S_2 O_6. 2 H_2 O.	2.189.		
[12]	Ca S_2 O_6. 4 H_2 O.	2.180.		
[13]	Mg S_2 O_6. 6 H_2 O.	1.666.		
[14] Sodium sulphate.	Na_2 S O_4.	2.55. Native.		
[15] " "	"	2.73.		
[16] Yttrium "	3 (Y S O_4). 8 H_2 O.	2.52.		
[17] Erbium "	3 (Er S O_4). 8 H_2 O.	3.17.		
[18] Didymium "		2.82.		
[19] Sodium selenate.	Na_2 Se O_4.	3.098.		
[20] Ammonium selenate.	Am_2. Se O_4.	2.162.		
[21] Manganous "	Mn Se O_4. 2 H_2 O.	2.949.		
[22] " "	Mn Se O_4. 5 H_2 O.	2.334.		
[23] " "	Mn Se O_4. 6 H_2 O.	1.928.		
[24] Ferrous "	Fe Se O_4. 7 H_2 O.	2.073.		
[25] Nickelous "	Ni Se O_4. 6 H_2 O.	2.314.		
[26] Potassium manganese selenate.	Mn K_2 $(Se O_4)_2$. 2 H_2 O.	3.070.		
[27] Ammonium magnesium selenate.	Mg Am_2 $(Se O_4)_2$. 6 H_2 O.	2.035.		
[28] Sodium octovanadate.	Na_{12} V_8 O_{28}. 4 H_2 O.	2.85, 18.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Silver octovanadate.	$Ag_{12} V_8 O_{26}$.	5.67, 18.°		
[2] Thallium orthovanadate.	$Tl_3 V O_4$.	8.6, 17.°		
[3] " metavanadate.	$Tl V O_3$.	6.019, 11.°		
[4] " pyrovanadate.	$Tl_4 V_2 O_7$.	8.21, 18°5. Precipitated.		
[5] " "	"	8.812, 18°5. Fused.		
[6] " octovanadate.	$Tl_{12} V_8 O_{26}$.	8.59, 17°5,		
[7] " decavanadate.	$Tl_{12} V_{10} O_{31}$.	7.86, 17.°		
[8] Potassium hydrogen arsenate.	$K H_2 As O_4$.	2.862.		
[9] Sodium antimonite.	$Na Sb O_2 . 3 H_2 O$.	2.864,		
[10] _____	$Na Sb_3 O_5 . H_2 O$.	5.05.		
[11] _____	$P Cl_5 . S O_2$.	1.667, 14.°	100.°	
[12] Potassium manganidcyanide.	$K_3 Cy_6 Mn$.	1.821.		
[13] Cyanic acid. l.	Cy H O.	1.1558,–20.°		
[14] " " "	"	1.140, 0.°		
[15] Hydrocyanic acid.	Cy H.	.710, 6.°		
[16] " "	"	.706, 2°8.		
[17] " "	"	.7058, 7.°	26°5.	s.—15.°
[18] " "	"	.6969, 18.°		
[19] Hydrosulphocyanic acid	Cy H S.	1.0013, 10.°		
[20] " "	"	1.022.		
[21] " "	"	1.0082.		
[22] Zinc and calcium.	$Zn_{12} Ca$.	6.3726.		
[23] " " "	"	6.369.		
[24] Zinc and antimony.	$Zn_3 Sb_2$.	6.48.		
[25] Lead and platinum.	Pb Pt.	15.77.		

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Tin and copper.*	Sn_5 Cu.	7.52.		
[2]	" " "	Sn_4 Cu.	7.50.		
[3]	" " "	Sn_3 Cu.	7.53.		
[4]	" " "	Sn_2 Cu.	7.74.		
[5]	" " "	Sn Cu.	8.12.		
[6]	" " "	Sn_2 Cu_3.	8.30.		
[7]	" " "	Sn Cu_2.	8.57.		
[8]	" " "	Sn Cu_3.	8.96. *		
[9]	" " "	Sn Cu_4.	8.80.		
[10]	" " "	Sn Cu_5.	8.87.		
[11]	" " "	Sn Cu_6.	8.91.		
[12]	" " "	Sn Cu_7.	8.90.		
[13]	" " "	Sn Cu_8.	8.86.		
[14]	" " "	Sn Cu_{10}.	8.83.		
[15]	" " "	Sn Cu_{15}.	8.80.		
[16]	Hexyl hydride.	C_6 H_{13}. H.	.6620, 19°.5.	65°–70.°	
[17]	" "	"	.6641, 18.°		
[18]	Heptyl "	C_7 H_{15}. H.	.689, 27.°	96.°	
[19]	" "	"	.6910, 19.°	97°–99.°	
[20]	" "	"	.6915, 18.°		
[21]	Dimethyl diethyl methane.	C_7 H_{16}.	.6958, 20°.5.	86°–87.° Two Samples.	
[22]	" " "	"	.709, 16.°	89°.5–90.° Two Samples.	
[23]	Octyl hydride.	C_8 H_{17}. H.	.7207, 15°.5.	122°–125.°	
[24]	" "	"	.7165, 15°.6.	118°–122.°	
[25]	Nonyl "	C_9 H_{19}. H.	.7279, 13°.5.	147°–148.°	
[26]	Decatyl "	C_{10} H_{21}. H.	.7394, 13°.5.	166°–168.°	
[27]	Hexylene.	C_6 H_{12}.	.6996, 0.°	65°–66.°	
[28]	"	"	.6997, 0.°	65°–66.°	
[29]	Phenyl butylene.	C_{10} H_{12}.	.9015, 15°.5.	176°–178.°	
[30]	Benzyl toluol.	C_{14} H_{14}.	.995, 17°.5.	279°–280.°	

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* All the determinations in this series represent the alloy in bars. Riche also gives determinations for the same alloys powdered.

Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] From cupric camphorate.	$C_5\ H_{14}$	.793.	105.°	
[2] Macene.	$C_{10}\ H_{18}$	.8529, 17°5.	160.°	
[3] Citronyl.	"	.857.	165.°	
[4] Oil of bergamot.	"	.856.	183.°	
[5] " orange.	"	.835.	180.°	
[6] From copaiva.	$C_{15}\ H_{24}$	.885.	250.°	
[7] Petrolene.	"	.891.	280.°	
[8] Ethyl alcohol.	$C_2\ H_6\ O.$	.7958, 15.°		
[9] " "	"	.8083, 0.°		
[10] " "	"	.7157, 99°9.		
[11] " "	"	.822, 20.°	79.°	
[12] " "	"	.8090, 17.°	78°53.	
[13] " "	"	.79481, 11.°	78.°	
[14] Propyl "	$C_3\ H_8\ O.$	.8198, 0.°		
[15] " "	"	.8125, 9°6.		
[16] " "	"	.7797, 50°1.	98.°	
[17] " "	"	.7494, 84.°		
[18] " "	"	.8066, 15.°	97°41.	
[19] " " iso.	"	.7876, 16.°	82°85.	
[20] Hydrate of isopropyl alcohol.	$(C_3\ H_8\ O)_7\ H_2\ O.$		80.°	
[21] " " "	$(C_3\ H_8\ O)_3.2\ H_2\ O.$	.832, 15.°	78°–80.°	
[22] " " "	$(C_3\ H_8\ O)_3.\ H_2\ O.$	.800, 15.°	81.°	
[23] Trimethyl carbinol.	$C_4\ H_{10}\ O.$	.7788, 30.°	82°5.	25°–25°5.
[24] " "	"	.8075, 0.°		
[25] " "	"	.7792, 37.°	82°94.	
[26] Hydrate of the above.	$(C_4\ H_{10}\ O)_2.\ H_2\ O.$	.8276, 0.°	80.°	
[27] Butyl alcohol. Normal.	$C_4\ H_{10}\ O.$	.8112, 15.°	114°–116.°	
[28] " " "	"	.8135, 22.°	116°88.°	
[29] " " Iso.	"	.8025, 19.°	118°–119.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dimethyl ethyl carbinol.	$C_5 H_{12} O$.	.828, 0.°	99°–100.°	s.—30.°
[2] Amyl alcohol.	"	.8148, 14.°	132.°	
[3] " "	"	.8199, 14.°	132.°	
[4] " "	"	.826, 0.°	130°–130°2.	
[5] " "	"	.833, 0.°	121.°	
[6] " "	"	.8244, 0.°		
[7] " "	"	.8144, 15.°	129°–130°1.	
[8] " "	"	.8102, 21°5.		
[9] " "	"	.8263, 0.°		
[10] " "	"	.8123, 19°7.		
[11] Dimethyl pseudopropyl carbinol.	$C_6 H_{14} O$.	.8364, 0.°	112°–113.°	s.—35.°
[12] Hexyl alcohol.	"	.8306, 0.°	135.° Two Samples.	
[13] " "	"	.8266, 0.°	135.°	
[14] Triethyl carbinol.	$C_7 H_{16} O$.	.8593, 0.°	140°–142.°	
[15] Butyl oxide.	$C_8 H_{18} O$.	.784, 0.°		
[16] " "	"	.7685, 20.°	140°5.	
[17] " "	"	.7555, 40.°		
[18] Acetic acid.	$C_2 H_4 O_2$.	1.05533, 15.°	117.°	16°45.
[19] " "	"	1.0026, 20.°	118°10.	
[20] Propionic acid.	$C_3 H_6 O_2$.	.9961, 19.°	140°71.	
[21] " "	"	1.0143, 0.°		
[22] " "	"	.9607, 49°6.	146°6.	
[23] " "	"	.9062, 99°8.		
[24] Butyric "	$C_4 H_8 O_2$.	.9580, 14.°	162°32.	o.°s.—18°
[25] " "	"	.9601, 14.°	162°63.	
[26] " " Iso.	"	.9503, 20.°	154°11.	
[27] " "	"	.9697, 0.°		
[28] " "	"	.9160, 52°6.	155°5.	
[29] " "	"	.8665, 99°8.		
[30] " "	"	.8220, 139°8.		

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Name	Formula	Specific Gravity.	Boiling Point.	Melting Point.
[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]		
		[illegible]	[illegible]	
		[illegible]		
		[illegible]	[illegible]	
		[illegible]		
		[illegible]	[illegible]	
		[illegible]		
		[illegible]	[illegible]	
		[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]		
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]		
		[illegible]	[illegible]	
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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Ethyl butyrate.	$C_6 H_{12} O_2$.	.890, 0.°		
[2]	" "	"	.871, 18°8.		
[3]	" "	"	.831, 55°6.	113.°	
[4]	" "	"	.7794, 100°1.		
[5]	Propyl "	$C_7 H_{14} O_2$.	.8789, 15.°	143°42.	
[6]	Butyl "	$C_8 H_{16} O_2$.	.8719, 0.°	149°5.	
[7]	" "	"	.8760, 12.°	164°77.	
[8]	Isobutyl "	"	.8798, 0.°		
[9]	" "	"	.86635, 16.°	150°–153.°	
[10]	" "	"	.81838, 98°4.		
[11]	" isobutyrate.	"	.87519, 0.°		
[12]	" "	"	.86064, 15.°	144°–145.°	
[13]	" "	"	.81192, 98°4.		
[14]	Ethyl valerate.	$C_7 H_{14} O_2$.	.894, 0.°		
[15]	" "	"	.8765, 20.°	144°6.	
[16]	" "	"	.8616, 40.°		
[17]	" caproate.	$C_8 H_{16} O_2$.	.8765, 17°5.	164°9–165°9.	
[18]	" "	"	.8898, 0.°		
[19]	" "	"	.8732, 20.°	165°5–166.°	
[20]	" "	"	.8594, 40.°		
[21]	" "	"	.887, 0.°		
[22]	" "	"	.8705, 20.°	160°4.	
[23]	" "	"	.8566, 40.°		
[24]	Hexyl "	$C_{12} H_{24} O_2$.	.865.	245°6.	
[25]	Ethyl heptylate.	$C_9 H_{18} O_2$.	.874, 24.°	187°–188.°	
[26]	Methyl nonylate.	$C_{10} H_{20} O_2$.	.8765, 17°5,	213°–214.°	
[27]	Ethyl "	$C_{11} H_{22} O_2$.	.8655, 17°5.	227°–228.°	
[28]	Propionic aldehyde.	$C_3 H_6 O$.	.8074, 21.°	48°77.	
[29]	Butyric " Iso.	$C_4 H_8 O$.	.803, 20.°	60°–62.°	
[30]	Valeric "	$C_5 H_{10} O$.	.768, 12°5.	92°5.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Valeric aldehyde.	$C_5 H_{10} O$.		90°5–91.°	
[2] Polyvaleral.	$(C_5 H_{10} O)_n$.	.90.	215.°	
[3] Acetone.	$C_3 H_6 O$.	.8008, 15.°		
[4] "	"	.7938, 18.°	56°–59.°	
[5] "	"	.7975, 15.°	56°–58°5.	
[6] Propione.	$C_5 H_{10} O$.	.813, 20.°	100°–101.°	
[7] Ethyl acetone.	"	.815, 17°5.	100°–102.°	
[8] Butyrone.	$C_6 H_{12} O$.	.819, 20.°	144.°	
[9] Ethyl propyl ketone.	"	.818, 17°5	122°–125.°	
[10] Valerone.	$C_7 H_{14} O$.	.833, 20.°	181°–182.°	
[11] Methyl caprone.	"	.813, 20.°	155°–156.°	
[12] Methyl amyl acetone.	"	.8747, 17.°	143°–145.°	
[13] Diethyl "	"	.898, 12.°	182°5.	
[14] Caprone.	$C_8 H_{16} O$.	.822, 20.°	220°–221.°	
[15] Malonic acid.	$C_3 H_4 O_4$.			140.°
[16] Lactic "	$C_3 H_6 O_3$.	1.2485, 15.°		
[17] Methylsalicylic acid.	$C_8 H_8 O_3$.	1.1845, 15.°		
[18] " "	"	1.1969, 0.°	223.°	
[19] " "	"	1.1819, 16.°		
[20] Butyl carbonate.	$C_9 H_{18} O_3$.	.9407, 0.°		
[21] " "	"	.9244, 20.°	207.°	
[22] " "	"	.9111, 40.°		
[23] Ethyl suberate.	$C_{12} H_{22} O_4$.	.991, 15.°	233°–235.°	
[24] Ethyl benzoate.	$C_9 H_{10} O_2$.	1.0502, 16.°	211°16.	
[25] Propyl "	$C_{10} H_{12} O_2$.	1.0316, 16.°	229°47.	
[26] Butyl "	$C_{11} H_{14} O_2$.	1.000, 20.°	247°32.	
[27] Cetyl "	$C_{23} H_{38} O_2$.			30.°
[28] Methyl propargylate.	$C_4 H_6 O$.	.83, 12°5.	61°–62.°	
[29] Amyl "	$C_8 H_{14} O$.	.84, 12.°	140°–145.°	
[30] Methyl isopropylsalicylate.	$C_{11} H_{14} O_3$.	1.062, 20.°	250.°	
[31] Methyl pyruvate.	$C_4 H_6 O_3$.	1.154. 0.°	134°–137.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Ethyl diethylglycollate.		.98.	175°–176.°	
[2] Pyruvic acetate.	$C_5 H_8 O_3$.	1.053, 11.°	175.	
[3] Cocinin.	$C_{42} H_{80} O_6$.			33°5.s.29°3.
[4] Ethyl glycide.	$C_5 H_{10} O_2$.	.94, 12.°		
[5] Methyl allyl oxide.	$C_4 H_8 O$.	.77, 11.°	46.°	
[6] Propargylic alcohol.	$C_3 H_4 O$.	.9628, 21.°	110°–115.°	
[7] From valeral.	$C_{20} H_{38} O_3$.	.895—.900.	260°–290.°	
[8] " "	$C_{10} H_{18} O$.	.862, 0.°	195.°	
[9] " "	"	.848, 20.°		
[10] " "	"	.944, 0.°	190,°	
[11] " diethyl acetone.	$C_{20} H_{34} O_2$.	.934, 12.°	249.°	
[12] Butyrone pinakone.	$C_{14} H_{30} O_2$.	.87, 20.°		68.° s. 57.°
[13] Butyl phenyl ketone.	$C_{11} H_{16} O$.	.993, 17°5.	225°–226.°	
[14] Benzyl anisol.	$C_{14} H_{14} O$.	1.073, 0.°	305.°	
[15] " "	"	.993, 100.°		
[16] Anisic alcohol.		1.1093, 26.°	258°8.	25.°
[17] " "		1.0507, 100.°		
[18] Methyl saligenine.	$C_8 H_{10} O_2$.	1.1200, 23.°	247°5.	
[19] " "	"	1.0532, 100.°		
[20] Thymol. From Ajowan oil.	$C_{10} H_{14} O$.	.939, 25°5. l.	226.°	53.°
[21] Isomer of terpinol.	$C_{20} H_{34} O_2$.	.853.	157.°	
[22] Inulin.	$C_6 H_{10} O_5$.	1.470.		
[23] Isobutyl cyanide.	$C_4 H_9$. Cy.	.8226, 0.°		
[24] " "	"	.8146, 10.°	126°–128.°	
[25] " "	"	.8060, 20.°		
[26] Propylamine.	$C_3 H_9 N$.	.7186, 20.°	49.°	
[27] Butylamine.	$C_4 H_{11} N$.	.7401, 20.°	76°–77.°	
[28] " Iso.	"	.7357, 15.°	67°5.	
[29] Trimethyl carbinolamine.	"	.6987, 15.°	45°–46.°	

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	Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1]	Tributylamine.	$C_{12}H_{27}N$.	.791, 0.°	211°–215.°	
[2]	«	«	.7782, 20.°		
[3]	«	«	.7677, 40.°		
[4]	Dimethyl aniline.	$C_8H_{11}N$.	.9553.	192.°	s. 0°5.
[5]	« toluidine.	$C_9H_{13}N$.	.9324.	186.°	
[6]	« «	«	.9368.	205.° Different Samples.	
[7]	« «	«	.988.	210.°	
[8]	Cumidine.	«	.9633.	225°–227.°	
[9]	Dimethyl xylidine.	$C_{10}H_{15}N$.	.9293.	196.°	
[10]	« cumidine.	$C_{11}H_{17}N$.	.9076.	213°–214.°	
[11]	Coniine. Artificial.	$C_8H_{15}N$.	.913, 0.°	168°–170.°	
[12]	« «	«	.899, 15.°		
[13]	« «	«	.842, 90.°		
[14]	« Natural.	«	.886, 0.°	168.°	
[15]	« «	«	.873, 15.°		
[16]	« «	«	.811, 90.°		
[17]	Paradiconiine.	$C_{16}H_{27}N$.	.915, 15.°	a. 210.	
[18]	Methyl formamide.	C_2H_5NO.	1.011, 19.°	190.°	
[19]	Ethyl «	C_3H_7NO.	.952, 21.°	196°–197.°	
[20]	Diethyl «	$C_5H_{11}NO$.	.908, 19.°	175°–178.°	
[21]	Allyl nitrate.	$C_3H_5NO_3$.	1.09, 10.°	106.°	
[22]	Ethylene dinitrate.	$C_2H_4N_2O_6$.	1.4837, 8.°		
[23]	« « (?).	«	1.48.		
[24]	Propylene «	$C_3H_6N_2O_6$.	1.335, 5.°		
[25]	Mononitric glycol.	$C_2H_5NO_3$.	1.31, 11.°		
[26]	Acetonitric «	$C_4H_7NO_5$.	1.29, 18.°		
[27]	Nitrolactic acid.	$C_3H_5NO_5$.	1.35, 12°8.		
[28]	Ethyl nitroglycollate.	$C_4H_7NO_5$.	1.2112, 15°2.	180°–182.°	
[29]	« nitrolactate.	$C_5H_9NO_5$.	1.1534, 13.°	178, p. d.	
[30]	« nitrotartronate.	$C_7H_{11}NO_7$.	1.2778, 16.° l.		45°–46.°
[31]	Diethyl nitromalate.	$C_8H_{13}NO_7$.	1.2094, 16.°		

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Paraffinic acid.	$C_{26}H_{26}NO_{10}$.	1.14, 15.°		
[2] Acetonitrose.		1.3487, 18.°		145.°
[3] Propyl chloride.	$C_3H_7.Cl.$	.9160, 18.°	46°.36	
[4] " "	"	.8959, 19.°	46°.44.	
[5] " " Iso.	"	.8722, 14.°	36°–37.°	
[6] Butyl "	$C_4H_9.Cl.$	.8972, 14.°	77°.96.	
[7] " " Iso.	"	.8798, 15.°	68°.5.	
[8] Heptyl "	$C_7H_{15}Cl.$		140°–142.°	
[9] Nonyl "	$C_9H_{19}Cl.$	.8962, 14.°	190°–198.°	
[10] Isovinyl "	$C_2H_3Cl.$	1.406.		
[11] Propylene chloride.	$C_3H_6Cl_2.$	1.1656, 14.°	96°.82.	
[12] " "	"	1.184, 0.°	96.°	
[13] " "	"	1.155, 25.°		
[14] " "	"	1.182, 0.°		
[15] " "	"	1.153, 25.°		
[16] Methylchloracetol.	$C_3H_6Cl_2.$	1.1058, 0.°	70.°	
[17] " "	"	1.0744, 25.°		
[18] " "	"	1.1125, 0.°		
[19] " "	"	1.0818, 25.°		
[20] " "	"	1.827. 16.°	69°.69.	
[21] Trichlorhydrin.	$C_3H_5Cl_3.$		155.°	
[22] "	"	1.40, 8.°	155.°	
[23] "	"	1.41, 0.°	154°–157.°	
[24] "	"	1.417, 15.°	154°–159.°	
[25] Dichloracetone chloride	$C_3H_4Cl_4.$	1.47, 13.°	153.°	
[26] Trichloracetone "	$C_3H_3Cl_5.$		194.°	
[27] Trichlortoluol.	$C_7H_5Cl_3.$	1.413, 9.°	227°–228.°	
[28] From crotonic aldehyde.	$C_4H_6Cl_2.$	1.131.	125°–127.°	
[29] Monochloracetone.	$C_3H_5ClO.$	1.17.	118°–120.°	
[30] Monoxethyl chlorhydrin	$C_5H_{11}ClO_2.$	1.117, 11.°	183°–185.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Dichlorethoxylethylene.	$C_4 H_6 Cl_2 O$.	1.08, 10°	128°.2.	
[2] Tetrachlorethyl oxide.	$C_4 H_2 Cl_8 O$.		189°.7.	
[3] From tetrachlorethyl oxide.	$C_4 H_5 Cl_3 O$.	1.5725, 0.°	154°.8.	
[4] " " "	"	1.2354, 99°.9.		
[5] Trichloracetal.	$C_6 H_{11} Cl_3 O_2$.	1.2813, 0.°		
[6] "	"	1.2655, 22°.2.	204°.8.	
[7] "	"	1.1617, 99°.96.		
[8] Chlorovaleral.	$C_5 H_9 Cl O$.	1.108, 14.°	134°–135.°	
[9] Derivative of valeral.	$C_{10} H_{12} Cl_6 O$.	1.397, 14.°	203 –204.°	
[10] " " "	$C_{10} H_{10} Cl_4 O$.	1.272, 14.°	208°–210.°	
[11] Acetylchloral alcoholate	$C_6 H_9 Cl_3 O_3$.	1.327, 11.°	198.°	
[12] Trichlorphenomalic acid	$C_6 H_7 Cl_3 O_5$.	1.5.		
[13] Metachlorsalicylic aldehyde.	$C_7 H_5 Cl O$.	1.29, 8.°	210°–220.°	
[14] Ethyl glycolic chloride.	$C_4 H_7 Cl O_2$.	1.145, 1.°	127 –128.°	
[15] Methyl chlorocrotonate.	$C_5 H_7 Cl O_2$.	1.143, 15.°	142.°	
[16] Ethyl "	$C_6 H_9 Cl O_2$.	1.113, 15.°	161°.4°	
[17] Propylenic chloronitrine	$C_3 H_6 Cl N O_3$.	1.28, 12.°	157°–158.°	
[18] Chloronitric glycol.	$C_2 H_4 Cl N O_3$.	1.378, 21,°	149°–150.°	
[19] Ethyl bromide.	$C_2 H_5 Br$.	1.4189, 15.°		
[20] Butyl " Normal.	$C_4 H_9 Br$.	1.2990, 20.°	99°.88.	
[21] " " Iso.	"	1.2038, 16.°	92°.33.	
[22] Amyl "	$C_5 H_{11} Br$.	1.2059. 15°.7.		
[23] Butylene " Iso.	$C_4 H_8 Br_2$.	1.809, 17.°	149°.7. (Two Samples.)	
[24] " " "	"	1.798, 14.°	148°–149.° (Two Samples.)	
[25] Hexylene "	$C_6 H_{12} Br_2$.	1.5967, 20.°	205.°	
[26] " "	"	1.5975, 18.°		
[27] Heptylene "	$C_7 H_{14} Br_2$.	1.5146, 18°.5.		
[28] Isovinyl "	$C_2 H_3 Br$.	2.075.		
[29] Bromo toluol.	$C_7 H_7 Br$.	1.401, 18.°	182°–183.°	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Monobromhydric glycol.	$C_2 H_5 Br O$.	1.66, 8.°	147.°	
[2] Bromonitric "	$C_3 H_4 N Br O_3$.	1.735, 8.°	164°–165.°	
[3] Bromo. allyl nitrate.	$C_3 H_4 N Br O_3$.	1.5, 13.°	140°–150.°	
[4] " " acetate.	$C_5 H_7 Br O_2$.	1.57, 12.°	163°–164.°	
[5] " " alcohol.	$C_3 H_5 Br O$.	1.6, 15.°	155.°	
[6] " methyl allyl oxide.	$C_4 H_7 Br O$.	1.35, 10.°	115°–116.°	
[7] Bromo. allyl chloride.	$C_3 H_4 Br Cl$.	1.63, 11.°	120.°	
[8] Derivative of chloral.	$C_2 H Cl_3 Br$.	2.317, 0.°		
[9] " " "	"	2.295, 19°5.	a. 200.°	
[10] " " "	"	2.129, 100.°		
[11] Butyl iodide. Normal.	$C_4 H_9 I$.	1.5804, 18.°	129°82.	
[12] " " Iso.	"	1.592, 22.°		
[13] " " "	"	1.6433, 0.°		
[14] " " "	"	1.6278, 10.°	117°5–118.°	
[15] " " "	"	1.6114, 20.°		
[16] Hexyl "	$C_6 H_{13} I$.	1.4526, 0.°	167.°	
[17] Heptyl " Pseudo.	$C_7 H_{15} I$.	1.20, 20.°	a. 180.°	
[18] Propyl sulphide.	$(C_3 H_7)_2 S$.	.814, 17.°	130°–135.°	
[19] Ethyl trisulphocarbonate.	$C_5 H_{10} S_3$.	1.152.	240.°	
[20] " disulphocarbonate	$C_5 H_{10} S_2 O$.	1.085, 19.°	196.° (Two isomers.)	
[21] " "	"	1.085, 19.°	200.° (Two isomers.)	
[22] " monosulphocarbonate.	$C_5 H_{10} S O_2$.	1.0285, 18.°	150°–156.° (Two isomers.)	
[23] " "	"	1.031, 19.°		
[24] Chloral sulphohydrate.			123.°	77.°
[25] Ethyl butylxanthate.	$C_7 H_{14} S_2 O$.	1.003, 17.°	227°–228.°	
[26] Butyl "	$C_9 H_{18} S_2 O$.	1.009, 12.°	247°–250.°	
[27] Amyl "	$C_{10} H_{20} S_2 O$.		265°–270.° p. d.	

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Name.	Formula.	Specific Gravity.	Boiling Point.	Melting Point.
[1] Sulphophosphorous ether.	$C_6 H_{15} P S_3$.	1.24, 12.°	240°–280.°	
[2] Ethyl sulphophosphoric chloride.	$C_2 H_5 P S Cl_2$.	1.30, 12.°	175.°	
[3] " pyrosulphophosphate.	$C_8 H_{20} P_2 S_3 O_4$.	1.1892, 17.°		
[4] Triethoxylpyrophosphorsulphobromide	$C_6 H_{15} P_2 S_3 Br O_3$	1.3567, 19.°		
[5] Ethyl silicate.	$C_8 H_{20} Si O_4$.	.9330 22°5.		
[6] Silicon triethyl hydride.	$C_6 H_{15} Si H$.	.7510, 0.°	107.°	
[7] " " chloride.	$C_6 H_{15} Si Cl$.	.9249, 0.°	143°5.	
[8] " " oxide.	$(C_6 H_{15} Si)_2 O$.	.8590, 0.°	231.°	
[9] " " hydrate.	$C_6 H_{15} Si. H O$.	.8709, 0.°	154.°	
[10] " " acetate.	$C_8 H_{18} Si O_2$.	.9039, 0.°	168.°	
[11] _____	$C_8 H_{20} Si O_2$.	.8752, 0.°	155°8.	
[12] _____	$C_8 H_{20} Si O$.	.8403, 0.°	153.°	
[13] Methyl orthosilicopropionate.	$C_5 H_{14} Si O_3$.	.9747, 0.°		
[14] _____	$C_{16} H_{40} Si_4 O_{12}$.	1.071, 0.°		
[15] _____	"	1.054, 14°5.		
[16] Mercury propyl.	$(C_3 H_7)_2 Hg$.	2.124, 16.°	189°–191.°	
[17] Stann-tripropyl iodide.	$(C_3 H_7)_3 Sn. I$.	1.692, 16.°	269°–270.°	

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THE END.

TELEGRAPHIC ANNOUNCEMENTS OF ASTRONOMICAL DISCOVERIES.

THE SMITHSONIAN INSTITUTION has completed arrangements for the immediate transmission by telegraph between Europe and America of accounts of astronomical discoveries, which, for the purpose of co-operative observation, require immediate announcement.

Among such discoveries are those of planets and comets, or of bodies which are generally so faint as not to be seen, except through the telescope; and which being in motion their place in the heavens must be made known to the distant observer before they so far change their position as not to be readily found. For this purpose the ordinary mail conveyance, requiring at least ten days, is too slow, since in that time the body will have so far changed its position as not to be found, except with great difficulty; and this change will become the greater if the body is a very faint one, for in that case it could only be discovered on a night free from moonlight, which of necessity, in ten or twelve days, must be followed by nights on which the sky is illuminated by the moon, and all attempts to discover the object would have to be postponed until the recurrence of a dark night. Indeed, even then the search often proves in vain; and it is not, in some cases, until after a set of approximate elements are calculated and transmitted, that the astronomers on the two sides of the Atlantic are able fully to co-operate with each other.

These difficulties were discussed by some of the principal astronomers of Europe, and an application was made to the Smithsonian Institution, through Dr. C. H. F. PETERS, of Hamilton College, New York, to remove them, by transmitting intelligence immediately through the Atlantic Telegraph Cable. For this purpose the Institution applied to the New York, Newfoundland and London Telegraph and to the Western Union Telegraph Companies to be allowed free transmission of this kind of intelligence, and have received through CYRUS W. FIELD, Esq., and WM. ORTON, Esq., with that liberality which has always attended applications of a similar character by the Institution, the free use of all the lines of these companies for the object in question.

Similar privileges have been granted in Europe for transmitting the intelligence between some of the principal centres of astronomical research in Europe and the eastern ends of the Atlantic cables.

It is not intended to restrict the transmission of intelligence to the discovery of planets and comets, but also to include that of any remarkable solar phenomenon which may suddenly present itself in Europe, and of which observations in America may be practicable for several hours after the sun has set to the European observer; also the sudden outburst of a star like that in the "Crown" in 1866, together with unexpected showers of shooting-stars, etc.

To carry out the proposition the following arrangements have been adopted:

I.

Centre of communication in the United States—

1. The Smithsonian Institution. JOSEPH HENRY, Director.

Centres of communication in Europe—

1. Greenwich Observatory. Sir GEORGE B. AIRY, Astronomer Royal.
2. Paris Observatory. M. LEVERRIER, Director.
3. Berlin Observatory. Prof. W. FOERSTER, Director.
4. Vienna Observatory, Academy of Sciences. Prof. VON LITTROW, Director.

II.

Telegrams received at the Smithsonian Institution from observers in the United States will be forwarded immediately by Atlantic Cable to Greenwich, Paris, Berlin, and Vienna, and thence by telegraph to other observatories in Europe.

III.

Discoveries made in Europe of new comets, planets, etc., will be announced without delay from Greenwich, Paris, Berlin, or Vienna by Atlantic Cable to the Smithsonian Institution, and thence by telegraph to American observatories and the Associated Press.

IV.

The telegraphic dispatch announcing a discovery should be as brief as

possible, and after conference with astronomers the following form has been agreed upon:

After the single word "PLANET" (or "COMET") is given,
(1st) its Right Ascension in time, hours and minutes only; next, separated by the word
(2d) *north* or *south*, is given its
(3d) Declination to the nearest minute.

In the case of a *planet*, in addition to the foregoing follows finally the magnitude expressed by the nearest ordinal number. In the case of a *comet* follows the word *bright* or *faint*, and it is well to add the direction of motion, requiring at the utmost two words combined, of S. W. N. E.; and also, if rapid, the quantity of its daily motion, the latter to the nearest whole number in degrees. For example, the following dispatch, "Planet, twenty-three, thirty-five north twenty-one forty-six eleventh" would be interpreted: A new planet is discovered in $23^h\ 35^m$ of right ascension and $+\ 21°\ 46'$ of declination; 11th magnitude.

Or a dispatch like the following: "Comet twenty-two forty-three north sixty-five thirty-one bright southeast three" would announce the discovery of a bright comet in right ascension $= 22^h\ 43^m$; declination $+\ 65°\ 31'$; the declination decreasing, right ascension increasing, daily motion about three degrees.

The preceding examples contain the greatest number of words required for any one dispatch, if composed according to the rule adopted. Usually they will not exceed ten. Sometimes, however, the dispatch thus composed would become equivocal, and it has therefore been established as an additional rule that the number expressing the minutes of right ascension or declination shall always be expressed in words, even when zero occurs. Therefore, $23^h\ 0^m$ should be written "twenty-three nought," while "twenty three" will be understood to mean $20^h\ 3^m$. In a similar way 0^h of Right Ascension or 0° of declination are to be distinctly expressed by the word "*nought.*"

The right ascension and declination in the dispatch will be understood to give the position (by proper motion approximately reduced) for the *midnight following* the date of the dispatch: Washington time for American discoveries, Greenwich time for European.

V.

Since, in conformity with the preceding article, only an approximate estimate of a later position, and not that of the first observation itself, is given, the dispatch is not to be considered as a document for deciding the question of priority of discovery.

We trust the time is not distant when, with the completion of a telegraphic cable between Japan and the United States, this system will be extended to the eastern part of Asia, and the astronomers who are now in process of education in the United States, both from China and Japan, will be able to participate in the facilities thus offered for co-operation in the advance of astronomy. In connection with the publication of this circular, the National Academy of Sciences, at its meeting on the 15th of April, adopted a resolution recommending that amateur astronomers devote a portion of their time to sweeping the sky for the discovery of comets.

JOSEPH HENRY,

Secretary Smithsonian Institution.

SMITHSONIAN INSTITUTION,

Washington, D. C., May, 1873.